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(54) **REVERSE OPENING SLIDE FASTENER**

REISVERSCHLUSS MIT UMGEKEHRTEM ÖFFNUNGSMECHANISMUS

FERMETURE À GLISSIÈRE À OUVERTURE INVERSÉE

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Description

TECHNICAL FIELD

[0001] The invention relates to a reverse opening slide fastener capable of performing upper opening and reverse opening and capable of separating and fitting by insertion.

BACKGROUND ART

[0002] A separable bottom end stop type slide fastener having a box pin and an insert pin at lower ends of zip tooth rows has been utilized as a slide fastener for performing opening and closing of right front and left front bodies of clothing.

[0003] In a general slide fastener with a separable bottom end stop, an insert pin is serially arranged at the lower end of one zip tooth row and a box pin to which the insert pin is to be inserted is serially arranged at the lower end of the other zip tooth row. The slide fastener with a separable bottom end stop has a structure that the insert pin is capable of being inserted to and removed from the box pin and a slider in a state that the slider is lowered to the lowermost end to be contacted to the box pin enabling to separate right and left fastener stringers.

[0004] Japanese Patent Application Laid-Open No. 2005-245859 (Patent Document 1) proposes an separable bottom end stop for a reverse slide fastener enabling bidirectional opening from both directions as the upward and downward directions by arranging two sliders of which rear openings are mutually opposed.

[0005] The reverse opening slide fastener disclosed in Patent Document 1 includes an upper slider and lower slider which enable opening and closing from both directions as the upward and downward directions. An insert pin capable of being inserted to and removed from the upper slider and the lower slider in a state that the upper slider and the lower slider are lowered to the lowermost end of the reverse opening slide fastener and rear portions thereof are mutually contacted is disposed at the lower end of a zip tooth row of one fastener stringer. Further, a box pin having a retaining stopper to engage the lower slider at the lowermost end is disposed at the lower end of a zip tooth row of the opposing fastener stringer.

CITATION LIST

PATENT DOCUMENT

[0006] Patent Document 1: Japanese Patent Application Laid-Open No. 2005-245859

SUMMARY OF THE INVENTION

PROBLEMS TO BE SOLVED BY THE INVENTION

[0007] When the reverse opening slide fastener with a separable bottom end stop described in Patent Document 1 is used for opening and closing of right front and left front bodies of clothing, right and left fastener stringers can be separated by removing the insert pin which is attached to the lower end of the zip tooth row from the upper slider and the lower slider after the upper slider is slid to the lowermost end. Then, the right and left fastener stringers can be re-coupled by inserting the insert pin to the upper slider and the lower slider. Problems possibly occurring at the time of coupling the right and left fastener stringers will be described with reference to FIGS. 11 and 12.

[0008] FIG. 11 is a partially enlarged view of an insert pin of a separable bottom end stop and a fastener stringer around a place where the insert pin is attached in FIG. 6 of Patent document 1. FIG. 12 is a planar sectional view illustrating an intermediate state of re-inserting an insert pin 930 which is once removed from the upper slider 50 and the lower slider 60 to the upper slider 50 and the lower slider 60.

[0009] Here, regarding the coordinate system of fastener stringers 916, 17 illustrated in FIGS. 11 and 12, the direction toward places where the insert pin 930 and the box pin 40 are attached is defined as a downward direction (D-direction) in the longitudinal direction of the fastener stringers 916, 17. Further, the direction opposite to the downward direction (D-direction) is defined as an upward direction (U-direction). Further, as illustrated in FIGS. 11 and 12, direction rightward and leftward orienting in the upward direction (U-direction) as being in parallel to faces of the fastener stringers 916, 17 are defined respectively as R-direction and L-direction.

[0010] First, the structure of the conventional first fastener stringer 916 to which the insert pin 930 is attached will be described with reference to FIG. 11. As illustrated in FIG. 11, the first fastener stringer 916 is provided with a fastener tape 11 having a core portion 14 formed at an opposing end edge, a row of first zip teeth 12 attached at regular intervals at the core portion 14, the insert pin 930 which is serially arranged in the downward direction (D-direction) of the first zip teeth 12 row, and a reinforcing film 24 which improves stiffness and strength at the vicinity of the insert pin 930.

[0011] As illustrated in FIG. 11, a flange slidingly-contacting side edge 930F is formed at the right side edge (i.e. , the side edge at R-direction) of the insert pin 930 and an opposing side edge 930C is formed at the left side edge (i.e., the side edge at L-direction) of the insert pin 930. A top end wall 930D having a flat section at a right angle against the longitudinal direction of the first fastener stringer 916 is formed at the top end part of the opposing side edge 930C. Regarding the insert pin 930 described in Patent Document 1, an extension line EL

extending the flange slidingly-contacting side edge 930F in the downward direction (D-direction) is intersected with the top end wall 930D approximately orthogonally. Here, the intersection point between the extension line EL and the top end wall 930D is defined as an intersection point ND.

[0012] Next, the structure of a conventional reverse opening slide fastener 910 in the related art will be described with reference to FIG. 12. FIG. 12 is a view illustrating an intermediate state that the insert pin 930 removed for opening the reverse opening slide fastener 910 is being re-inserted from the shoulder opening at the right side (R-direction) of the upper slider 50 after lowering the upper slider to the lowermost end where the rear opening of the upper slider 50 and the rear opening of the lower slider 60 are contacted. Further, FIG. 12 is a planar sectional view illustrating the inside of zip tooth guide passages 50T, 60T sectioned at a sectional face being approximately in parallel to the fastener tape 11 between top blades of the upper slider 50 and the lower slider 60 and the first and second fastener stringers 916, 17 as sectioning the upper slider 50 and the lower slider 60.

[0013] The reverse opening slide fastener 910 illustrated in FIG. 12 is an opening and closing device enabling to perform opening and closing between a left front body and a right front body of a long coat, for example. The reverse opening slide fastener 910 includes a right-and-left pair of fastener tape 11, core portions 14 formed respectively along opposing end edges of the fastener tapes 11, and a number of first and second zip teeth 12, 13 formed in an alignedmanner at regular intervals as nipping the core portions 14 respectively.

[0014] Further, the reverse opening slide fastener 910 includes the upper slider 50 capable of performing upper opening and the lower slider 60 capable of performing reverse opening to which the first and second zip teeth 12, 13 are inserted. Here, the rear opening of the upper slider 50 and the rear opening of the lower slider 60 are arranged to be opposed. As illustrated in FIG. 12, a reinforcement film 24 formed of a resin-made film and the like is stuck respectively to both faces at the lower end part (i.e., the end part in D-direction) of the first and second fastener stringers 916, 17. The insert pin 930 and the box pin 40 are serially arranged to the first and second zip teeth 12, 13 rows as nipping both the reinforcement film 24 and the core portion 14.

[0015] A hook-shaped stopper 46 is formed at the lower end (i. e. , the end part in D-direction) of the box pin 40. The stopper 46 prevents the lower slider 60 from dropping from the lower side by being contacted to the shoulder part of the lower slider 60 or the end part of a flange 60F of the lower slider 60 in a state that the lower slider 60 is lowered to the lowermost end. FIG. 12 illustrates an embodiment in which the stopper 46 is engaged with the lower end of the flange 60F of the lower slider 60 by protruding the stopper 46 to the left direction (L-direction) from the lower end of the box pin 40.

[0016] A top blade (not illustrated) and a back blade 53 of the upper slider 50 of FIG. 12 are mutually fixed with a guide column 50D at an upper part (i.e., a part in U-direction) of the center part in the right-left direction (i.e., the center part in R-L direction) of the upper slider 50. A flange 50F is extended in an opposing manner respectively from the both side edges at right and left of the top blade and back blade 53 of the upper slider 50.

[0017] The zip tooth guide passage 50T to which the right-and-left pair of the first zip teeth 12 row and the second zip teeth 13 row are inserted is formed at the inside of the upper slider 50 surrounded by the top blade, the back blade 53 and the flanges 50F as being a Y-shaped space in a planar view. Here, a tab support member (not illustrated) which swingably supports a tab of the upper slider 50 is formed at the top face side (i.e., the near side of the paper face of FIG. 12) of the top blade of the upper slider 50.

[0018] Shoulder openings of the zip tooth guide passage 50T are opened respectively at both sides at right and left (R-L direction) of the guide column 50D of the upper slider 50. The rear opening of the zip tooth guide passage 50T is opened at the lower end part (i.e., the end part in D-direction) of the upper slider 50. A tape insertion passage (not illustrated) is formed at the end edge section of the flange 50F along the end edge of the flange 50F. The tape insertion passage is a section on which the fastener tape 11 slides at the time of sliding the upper slider 50 as being a gap through which the fastener tape 11 attached with the first zip teeth 12 row and the second zip teeth 13 row having the zip tooth guide passage 50T inserted passes.

[0019] Similarly to the above-mentioned upper slider 50, the lower slider 60 of FIG. 12 is also formed with a top blade (not illustrated), a back blade 63, a guide column 60D, flanges 60F, a zip tooth guide passage 60T, shoulder openings, a rear opening, and a tape insertion passage. Further, a tab support member (not illustrated) which swingably supports a tab of the lower slider 60 is formed at the top face of the top blade of the lower slider 60.

[0020] As illustrated in FIG. 12, to re-couple the first fastener stringer 916 and the second fastener stringer 17 from a state of being once separated, the removed insert pin 930 is inserted from the shoulder opening (i.e., the shoulder opening at the right side (R-direction) in the example of FIG. 12) of the upper slider 50. At that time, after the insert pin 930 is inserted from the shoulder opening of the upper slider 50, the insert pin 930 is inserted into the zip tooth guide passages 50T, 60T of the upper slider 50 and the lower slider 60 in the downward direction (D-direction) while the vicinity of the reinforcement film 24 at the lower part of the first fastener stringer 916 is held by a user and is rotated counterclockwise as illustrated in FIG. 12 so that the insert pin 930 is to be in parallel to the box pin 40.

[0021] Here, in a case that the insert pin 930 is carelessly advanced straightly from the shoulder opening of

the upper slider 50 without being rotated counterclockwise in the vicinity of the reinforcement film 24 at the lower part of the first fastener stringer 916, the top end wall 930D formed as being approximately orthogonal to the extension line EL collides with the guide column 60D of the lower slider 60 (in particular, at the vicinity of the tip of the guide column 60D) head on when one side edge of the insert pin 930 is slidingly contacted to the flange 50F of the upper slider 50 and the other side edge is slidingly contacted to the box pin 40, as illustrated in FIG. 12 for example.

[0022] In a general reverse opening slide fastener 910, the collision occurs with the guide column 60D at the vicinity of the intersection point ND where the top end wall 930D and the extension line EL are intersected. Here, since the top end wall 930D of the insert pin 930 collides with the surface of the guide column 60D approximately in the normal direction, the insert pin 930 cannot be further lowered in the downward direction (D-direction). Accordingly, the insert pin 930 is stopped at the position colliding with the guide column 60D (i.e., the position where the insert pin does not reach the lowermost end).

[0023] At that time, the user may acknowledge stopping of the insert pin 930 inserted from the shoulder opening of the upper slider 50 with feeling and misunderstand that the insert pin 930 is inserted to a predetermined position. When the user decide that the insert pin 930 has been inserted to the predetermined position, the user subsequently performs sliding operation of the upper slider 50 in the upward direction (U-direction) to close the reverse opening fastener 910.

[0024] However, in a state that the top end wall 930D of the insert pin 930 is contacted to the upper part (i.e., the tip in U-direction) of the guide column 60D as illustrated in FIG. 12, the first zip tooth 12 being a counterpart to be coupled with the second zip tooth 13 which is attached right above the box pin 40 is not lowered to a predetermined position. Accordingly, even if the upper slider 50 is being moved in the upward direction (U-direction) from the state of FIG. 12, the second zip tooth 13 attached right above the box pin 40 collides with the upper part of the insert pin 930 and the second zip tooth 13 and the insert pin 930 cannot be coupled. Therefore, the insert pin 930 gets stuck with an inner face of the flange 50F of the upper slider 50. In this case, the upper slider 50 cannot be slid in the upward direction (U-direction).

[0025] Here, when the user tries to forcibly slide the upper slider 50 in the upward direction (U-direction), there is a fear that the reverse opening slide fastener may be broken. Further, the user feels insufficient operability of the reverse opening slide fastener 910 owing to incapability of sliding the upper slider 50.

[0026] To address the above issues, the invention provides a reverse opening slide fastener for performing separating and coupling between right and left fastener stringers in which an insert pin can be smoothly inserted to a predetermined position even in a case that the insert pin is carelessly inserted from a shoulder opening of an upper slider as being advanced straightly when the right and left fastener stringers once separated are to be recoupled.

MEANS FOR SOLVING THE PROBLEMS

[0027] To achieve the above object, the invention provides a reverse opening slide fastener in which upper and lower sliders are arranged having rear openings mutually opposed and in which the top end of an insert pin can be inserted beyond a rear opening side tip of a guide column of a lower slider when the insert pin is inserted into the upper and lower sliders from a shoulder opening of the upper slider, including: a right-and-left pair of first and second fastener stringers; the insert pin and a box pin which are arranged respectively at a lower end of inner side edge sections of the first and second fastener stringers; and the upper slider and the lower slider which open and close the first and second fastener stringers; wherein the insert pin includes a side edge at the box pin side and a side edge at a tape inner side being arranged opposite to the side edge at the box pin side; a first sloped section sloped in a direction to be apart from the box pin toward the top end of the insert pin is formed at the side edge at the box pin side; and the first sloped section is formed as being intersected, at an intersection point, with an extension line obtained by extending a planar section of the side edge at a tape inner side to the top end side of the insert pin and has a shape sloped at an angle to be contacted to the guide column of the lower slider or to be apart from the guide column when the insert pins inserted to the upper and lower sliders, characterized in that the insert pin is structured so that in a state that the side edge at a tape inner side is slidingly contacted to a flange of the upper slider and the side edge at the box pin side is slidingly contacted to an opposing side edge of the box pin, a distance between a contact point of the side edge at the box pin side with the box pin and the intersection point is larger than a distance between the contact point and a tip of the guide column.

[0028] Here, it is preferable that a side face of the first sloped section of the side edge at the box pin side is formed into a continuously curved shape.

[0029] Further, it is preferable that a second sloped section sloped in a direction to be apart from the box pin toward the top end of the insert pin is formed at the side edge at a tape inner side being at the opposite side to the first sloped section, and a width dimension between the first sloped section at the side edge at the box pin side and the second sloped section at the side edge at a tape inner side is decreased toward the top end of the insert pin.

[0030] Furthermore, it is preferable that the lower slider includes top and back blades which are connected by the guide column and a stopper pawl which is arranged at one of the top and back blades, a pawl guide sloped

face which is sloped to gradually decrease thickness of the insert pin toward the insert pin top end is formed at a surface of the top end part of the insert pin at the stopper pawl side, and the pawl guide sloped face is formed as crossing over the extension line.

EFFECTS OF THE INVENTION

[0031] In the reverse opening slide fastener according to the invention, the insert pin includes the box pin slidingly-contacting side edge arranged at the box pin side and the flange slidingly-contacting side edge arranged at the tape inner side. Further, the first sloped section sloped in the direction to be apart from the box pin side toward the top end of the insert pin is formed at the box pin slidingly-contacting side edge. The first sloped section formed at the box pin slidingly-contacting side edge is formed as being intersected with the extension line obtained by extending the planar section of the flange slidingly-contacting side edge to the top end side of the insert pin. Further, the first sloped section has a shape sloped at the angle to be contacted to the guide column of the lower slider or to be apart from the guide column when the insert pin is inserted to the upper and lower sliders. In particular, it is preferable that the first sloped section of the box pin slidingly-contacting side edge has a shape sloped at an angle to be contacted to a side face at the insert pin side of the guide column of the lower slider or to be apart from the side face at the insert pin side.

[0032] According to the reverse opening slide fastener of the invention having the above structure, the insert pin can be smoothly inserted to a position of the lowermost end even in a case that the insert pin is carelessly inserted from the shoulder opening of the upper slider as being advanced straightly when the right and left fastener stringers once separated are to be re-coupled.

[0033] Describing more specifically, there has been a problem that insertion operation of the insert pin is disturbed in the related art owing to collision of the top end wall (i.e., the top end face) of the insert pin with the guide column of the lower slider as described above in a case that the base end part side of the flange slidingly-contacting side edge of the insert pin is slidingly contacted to the flange of the upper slider and top end part side of the box pin slidingly-contacting side edge is slidingly contacted to the box pin, for example, when the insert pin is inserted into the upper and lower sliders from the shoulder opening of the upper slider.

[0034] In contrast, according to the invention, even in a case that the base end part side of the flange slidingly-contacting side edge of the insert pin is slidingly contacted to the flange of the upper slider and the top end part side of the box pin slidingly-contacting side edge is slidingly contacted to the box pin, the top end of insert pin is inserted beyond the rear opening side tip of the guide column while the first sloped section of the insert pin is contacted to the guide column (in particular, the side face of the guide column) of the lower slider and the top end of the insert pin is guided in a direction to be apart from the box pin owing to the slope of the first sloped section. Alternatively, the top end of the insert pin is inserted beyond the rear end side tip of the guide column without collision of the first sloped section of the insert pin with the guide column. Accordingly, the insert pin can be smoothly inserted to the lowermost end position without being stopped by collision with the guide column of the lower slider. Here, the lowermost end position of the insert pin refers to a position where the top end of the insert pin reaches the shoulder opening side beyond the rear opening side tip of the guide column of the lower slider and the insert pin becomes approximately in parallel to the box pin. Further, the side face of the guide column refers to a wall face of the guide column of which gradient (when the face is a curved face, gradient of a tangential line) against the longitudinal direction of the slider is 45 degrees of smaller.

[0035] Further, in the invention, the side face of the first sloped section (in particular, the opposing side face of the first sloped section opposing to the guide column of the lower slider) of the box pin slidingly-contacting side edge can be formed into a continuously curved shape. With the above, collision of the top end part of the insert pin with the guide column of the lower slider can be reliably prevented when the insert pin is inserted from the shoulder opening of the upper slider, so that the insert pin can be inserted to the lowermost end position more smoothly. Further, since the side face of the first sloped section is a curved face, the length of the insert pin can be shortened. Accordingly, the insert pin can be accommodated in the zip tooth guide passages of the upper and lower sliders in a state that the lower slider is lowered to the lowermost position, so that the insert pin can be concealed from the outside.

[0036] Further, the reverse opening slide fastener of the invention can be structured such that the second sloped section sloped in the direction to be apart from the box pin toward the top end part of the insert pin is formed at the flange slidingly-contacting side edge of the insert pin and the width dimension between the first sloped section of the box pin slidingly-contacting side edge and the second sloped section of the flange slidingly-contacting side edge is decreased toward the top end of the insert pin. With the above, the first sloped section can be reliably formed while maintaining strength of the insert pin top end part and the flange slidingly-contacting side edge can be prevented from being interfered with the flange and the like of the lower slider at the time of inserting the insert pin. Accordingly, insertion operation of the insert pin can be performed more smoothly and stably.

[0037] Further, in the invention, the pawl guide sloped face sloped to gradually decrease thickness of the insert pin toward the top end of the insert pin is formed at the surface of the top end part of the insert pin as crossing over the extension line. Thus, since the pawl guide sloped

face is formed to cross over the extension line as being intersected with the extension line, the surface at the top end part of the insert pin is shaped spherical in combination with the pawl guide sloped face and the sloped face (i.e., the curved face) of the first sloped section. Accordingly, even if the top end of the insert pin is moved linearly or along with rotation when the insert pin is inserted, the stopper pawl of the lower slider can be guided along the pawl guide sloped face as being slidingly contacted to the pawl guide sloped face reliably. Therefore, the stopper pawl can be stably retracted.

BRIEF DESCRIPTION OF THE DRAWINGS

[0038]

FIG. 1 is a plane view of a reverse opening slide fastener according to the invention.
FIG. 2 is a planar sectional view at the vicinity of a lower slider in a state that the lower slider is lowered to the lowermost end in the reverse opening fastener of FIG. 1.
FIG. 3 is an explanatory plane view of an insert pin and a box pin in a state that right and left fastener stringers are separated.
FIG. 4 is a side view of the insert pin viewing from the box pin side in FIG. 3 being a view on arrow IV-IV.
FIG. 5 is a perspective view of the insert pin of FIG. 3.
FIG. 6 is a planar sectional view illustrating an intermediate state that the once-removed insert pin is reinserted to upper and lower sliders after the upper and lower sliders are lowered to the lowermost end.
FIG. 7 is a side view of the state of FIG. 6 viewing from the box pin side being a view on arrow VII-VII.
FIG. 8 is a view illustrating a state that the vicinity of the top end part of the insert pin is faced to a guide column of the lower slider with further inserting of the insert pin from the state of FIG. 6.
FIG. 9 is a planar sectional view illustrating as enlarging the vicinity of the top end part of the insert pin and a section of the guide column of FIG. 8.
FIG. 10 is a planar sectional view illustrating a state that the insert pin is inserted to the lowermost end.
FIG. 11 is a partially enlarged view of an insert pin of a conventional separable bottom end stop and a fastener stringer around a place where the insert pin is attached in Patent Document 1.
FIG. 12 is a view illustrating a state that the top end part of the insert pin is contacted to a guide column of a lower slider when the conventional insert pin of FIG. 11 is inserted to an upper slider and the lower slider.

BEST MODE FOR CURRYING OUT THE INVENTION

[0039] In the following, exemplary embodiments of a reverse opening slide fastener according to the invention will be specifically described with reference to the drawings. FIG. 1 is a plane view of a reverse opening slide fastener 10 according to the invention. FIG. 2 is a planar sectional view at the vicinity of a lower slide in a state that the lower slide is lowered to the lowermost end in the reverse opening fastener of FIG. 1. FIG. 3 is an explanatory plane view of an insert pin and a box pin in a state that right and left fastener stringers are separated. FIG. 4 is a side view of the insert pin viewing from the box pin side in FIG. 3 being a view on arrow IV-IV. FIG. 5 is a perspective view of the insert pin of FIG. 3.

[0040] The reverse opening slide fastener 10 illustrated in FIG. 1 is an opening and closing device capable of opening and closing a left front body and a right front body of a jacket and a long coat, for example. As illustrated in FIG. 1, the reverse opening slide fastener 10 includes a right-and-left pair of first and second fastener stringers 16, 17, and an upper slider 50 and a lower slider 60 which have a first zip teeth 12 row and a second zip teeth 13 row attached to opposing end edges of the first and second fastener stringers 16, 17 inserted respectively thereto and which perform coupling and separating of the first zip teeth 12 row and the second zip teeth 13 row. The first and second zip teeth 12, 13 capable of being mutually coupled are coupled with entering of an engaging convex portion of one side into an engaging concave portion of the other side.

[0041] The first fastener stringer 16 includes a fastener tape 11 having a core portion 14 formed at an opposing side edge (i.e., an inner side edge), the row of a number of the first zip teeth 12 formed in an aligned manner at regular intervals being evenly spaced apart as nipping the core portion 14, and an upper stopper 18 disposed at one end part of the first zip teeth 12 row. The upper stopper 18 is a member to prevent the upper slider 50 from dropping from the first zip teeth 12 row. Further, a reinforcement film 24 formed of a resin-made film and the like is stuck respectively to both faces of the fastener tape 11 at the other end part of the first zip teeth 12 row. An insert pin 30 is serially arranged as nipping both the reinforcement film 24 and the core portion 14.

[0042] The second fastener stringer 17 includes a fastener tape 11 having a core portion 14 formed at an opposing side edge (i. e. , an inner side edge), the row of a number of the second zip teeth 13 formed in an aligned manner at regular intervals being evenly spaced apart as nipping the core portion 14, and an upper stopper 18 disposed at one end part of the second zip teeth 13 row. The upper stopper 18 is a member to prevent the upper slider 50 from dropping from the second zip teeth 13 row. Further, a reinforcement film 24 formed of a resin-made film and the like is stuck respectively to both faces of the fastener tape 11 at the other end part of the second zip teeth 13 row. A box pin 40 for holding as positioning the lower slider 60 at the lowermost end is serially arranged as nipping both the reinforcement film 24 and the core portion 14. A separable bottom end stop 22 is constituted with the insert pin 30, the box pin 40 and the lower slider 60.

[0043] Here, regarding a coordinate system of the reverse opening slide fastener 10, the longitudinal direction of the fastener tape 11 is defined as the upper-lower direction. Regarding the rows of the first and second zip teeth 12, 13, a direction toward a position where the upper stopper 18 is located is defined as the upward direction (i.e., U-direction) of the reverse opening slide fastener 10 and a direction toward a position where the insert pin 30 and the box pin 40 are arranged is defined as the downward direction (i.e., D-direction). Further, regarding the top-back direction of the fastener tape 11 of FIG. 1, the near side against the paper face is defined as the top face (indicated as T-direction in FIG. 4) of the reverse opening slide fastener 10 and the opposite side is defined as the back face (indicated as B-direction in FIG. 4). Further, as illustrated in FIGS. 1 to 3 and 5, the tape width direction of the fastener tape 11 is defined as the right-left direction. The right side as observing the top face of the reverse opening slide fastener 10 (i.e., in T-direction) is defined as R-direction and the left side is defined as L-direction. Here, U-direction, T-direction and R-direction are opposite respectively to D-direction, B-direction and L-direction.

[0044] Next, a structure of each part of the box pin 40 will be described with reference to FIGS. 3 to 5. The box pin 40 arranged below the second zip teeth 13 row at the lower end part of the opposing end edge of the second fastener stringer 17 is formed into an elongated bar-like shape along the core portion 14 of the fastener tape 11. The box pin 40 is capable of positioning the insert pin 30 which is inserted to zip teeth guide passages of the upper slider 50 and the lower slider 60 at the lowermost end of the second fastener stringer 17 while performing positioning of the lower slider 60 at the lowermost end. Here, the lower slider 60 is arranged closer to the insert pin 30 and the box pin 40 than the upper slider 50. Further, the upper slider 50 and the lower slider 60 are arranged as being oriented so that rear openings thereof are mutually faced.

[0045] Here, the right side edge (i. e. , the side edge in R-direction) of the bar-shaped box pin 40 is defined as a flange slidingly-contacting side edge 40F which is arranged at the tape inner side and the left side edge (i.e., the side edge in L-direction) is defined as an opposing side edge 40C which is arranged at the insert pin 30 side. The flange slidingly-contacting side edge 40F is a section to which flanges 50F, 60F of the upper and lower sliders 50, 60 are slidingly contacted. That is, when the lower slider 60 and the upper slider 50 are slid respectively to the lowermost end position being the end position at the box pin 40 side, the flanges 50F, 60F are slidingly contacted to the flange slidingly-contacting side edge 40F in the zip tooth guide passages 50T, 60T of the lower slider 60 and the upper slider 50 (see FIG. 2 and FIGS.6 to 10 to be described later).

[0046] As illustrated in FIGS. 2 and 3, a hook-like stopper 46 shaped as being protruded rightward (in R-direction) is formed at the lower end part of the box pin 40 at the second fastener stringer 17. As illustrated in FIG. 2, a shoulder portion of the lower slider 60 which is lowered to the lowermost end is to be contacted to the stopper 46. With this structure, the stopper 46 prevents the lower slider 60 from dropping downward (i.e., in D-direction).

[0047] In the embodiment illustrated in FIGS. 2 and 3, the stopper 46 is shaped as being protruded rightward (i. e. , in R-direction) from the lower end of the box pin 40. With the above, the flange 60F at the shoulder portion of the lower slider 60 can be engaged with the stopper 46 when the lower slider 60 is slid to the lowermost end position. Here, the shape of the stopper 46 according to the invention is not limited to the shape of the stopper 46 illustrated in FIGS. 2 and 3. It is also possible to prevent the lower slider from dropping downward (i.e., D-direction) with a structure that the stopper is shaped as being protruded to the top direction (T-direction) or the back direction (B-direction) of the slide fastener from the lower end part of the box pin and the protruded portion is contacted to a top blade 62 or a back blade 63 (see FIG. 7 to be described later) of the lower slider 60.

[0048] An opposing side edge 40C of the box pin 40 is arranged at the opposite side to the flange slidingly-contacting side edge 40F and is an opposing face which opposes to the insert pin 30. As illustrated in a plane view of FIG. 3, a second engaging guide piece 42 shaped like a triangular piece which forms a second engaging portion 44 and a guide face 43 is formed at an upper part (i.e., a part in U-direction) of the opposing side edge 40C of the box pin 40 as being protruded from the opposing side edge 40C. The second engaging portion 44 is formed in a planar shape at the upper side (i.e., U-direction) where the second zip teeth 13 row exists. The guide face 43 has a shape of which dimension in the width direction is gradually increased toward the upper side (i.e., U-direction). The guide face 43 is structured as a sloped guide face which opens the lower end part of the box pin 40 in the right direction (R-direction) as slidingly-contacting on a guide column 60D of the lower slider 60 when the lower slider 60 is slid in the upward direction (U-direction) from the lowermost end. The guide face 43 is formed as a guide face to perform smooth transition to a coupled state between the first zip teeth 12 row and the second zip teeth 13 row and to a released state from the coupled state.

[0049] In the present embodiment, each guide column 50D, 60D of the upper and lower slider 50, 60 has a tip at the rear opening side. Each guide column 50D, 60D has a sloped face of which thickness in the width direction is gradually increased from the tip toward the shoulder opening and a sloped face of which thickness in the width direction is gradually decreased at the shoulder opening side via an inflection point. Further, the sloped face at the shoulder opening side has a larger slope angle than that of the sloped face of which thickness is gradually increased at the rear opening side. In this case, regarding the sloped face formed at the tip side of the guide column 50D, 60D, a wall face of which gradient of a tangential

line against the longitudinal direction of the slider is large than 45 degrees is to be a rear face at the vicinity of the tip of the guide column 50D, 60D and right and left wall faces of which gradient of a tangential line against the longitudinal direction of the slider is 45 degrees or smaller are to be side faces of the guide column 50D, 60D.

[0050] Next, a structure of each part of the insert pin 30 will be described with reference to FIGS. 3 to 5. The insert pin 30 arranged below the first zip teeth 12 row at the lower end part of the opposing end of the first fastener stringer 16 is formed into an elongated bar-like shape along the core portion 14 of the fastener tape 11. The top end part of the insert pin 30 is curved to the left direction (L-direction) to facilitate insertion of the once-removed insert pin 30 from an oblique upper side into the zip tooth guide passages of the upper slider 50 and the lower slider 60.

[0051] Here, the left side edge (i. e. , the side edge in L-direction) of the bar-shaped insert pin 30 is defined as a flange slidingly-contacting side edge 30F which is arranged at the tape inner side and the right side edge (i.e., the side edge in R-direction) is defined as a box pin slidingly-contacting side edge (i.e., an opposing side edge) 30C which is arranged at the box pin 40 side. The flange slidingly-contacting side edge 30F of the insert pin 30 is a section to which the flanges 50F, 60F of the upper slider 50 and the lower slider 60 are slidingly contacted (see FIG. 2 and FIGS. 6 to 10 to be described later) when the once-removed insert pin 30 is inserted to the zip tooth guide passages 50T, 60T of the upper slider 50 and the lower slider 60 (see FIG. 2 and FIGS. 6 to 10 to be described later).

[0052] Further, as illustrated in FIG. 4, the top side edge (i.e., the side edge in T-direction) of the insert pin 30 is defined as a top wall 30T and the back side edge (i.e., the side edge in B-direction) is defined as a back wall 30B. The top wall 30T and the back wall 30B of the insert pin 30 are sections to which inner walls of the top blade 62 and the back blade 53 of the upper slider 50 and the lower slider 60 (see FIG. 7 to be described later) are slidingly contacted when the insert pin 30 is inserted into the zip tooth guide passages 50T, 60T of the upper slider 50 and the lower slider 60 (see FIG. 2 and FIGS. 6 to 10 to be described later).

[0053] As illustrated in FIG. 3, the box pin slidingly-contacting side edge 30C of the insert pin 30 is an opposing face which opposes to the box pin 40 as being arranged at the opposite side to the flange slidingly-contacting side edge 30F. The box pin slidingly-contacting side edge 30C includes a planar section being in parallel to the tape length direction and a first sloped section 30E formed into a shape sloped in a direction to be apart from the box pin 40 side toward the top end part of the insert pin 30 as being arranged at the insert pin top end side than the planar section. As described later, the first sloped section 30E has a shape sloped at an angle so as to be contacted to an insert-pin-side side face of the guide column 60D of the lower slider 60 (or so as to be apart from the insert-pin-side side face of the guide column 60D) in a case that the insert pin 30 is inserted to the upper and lower sliders 50, 60 and that the flange slidingly-contacting side edge 30F of the insert pin 30 is slidingly contacted to the flange 50F of the upper slider 50 and the box pin slidingly-contacting side edge 30C of the insert pin 30 is slidingly contacted to the opposing side edge 40C of the box pin 40.

[0054] Further, as illustrated in FIG. 3, the flange slidingly-contacting side edge 30F has a planar section which is arranged at the first zip teeth 12 row side in parallel to the tape length direction to be contacted to the flange 50F of the upper slider 50 when the insert pin 30 is inserted thereto and a second sloped section 30G sloped in a direction to be apart from the box pin 40 side toward the top end part of the insert pin 30. In this case, the second sloped section 30G is formed at the opposite side to the first sloped section 30E at the box pin slidingly-contacting side edge 30C side. Further, the width dimension (i.e., the dimension in R-L direction) between the second sloped section 30G and the first sloped section 30E at the box pin slidingly-contacting edge 30C side is gradually decreased toward the top end of the insert pin 30. That is, the second sloped section 30G at the flange slidingly-contacting side edge 30F side is formed with angle variation being more gradual than that of the first sloped section 30E at the box pin slidingly-contacting side edge 30C side. With this structure, the first sloped section 30E can be reliably formed while maintaining strength of the insert pin top end part and the flange slidingly-contacting side edge 30F can be prevented from being interfered with the flange 60F of the lower slider 60 and the like during insertion of the insert pin 30.

[0055] Here, an extension line EL denotes a line extending the planar section of the flange slidingly-contacting side edge 30F which contacts to the flange 50F of the upper slider 50 at the time of insertion of the insert pin 30 toward the top end part of the insert pin 30. The first sloped section 30E sloped at the box pin slidingly-contacting side edge 30C is formed to have a large degree of slope to be intersected with the extension line EL. Specifically, as illustrated in FIG. 8, the extension line EL is the extension line of the planar section which contacts to the flange 50F of the upper slider 50 when the insert pin 30 is inserted from the shoulder opening of the upper slider 50 and the box pin slidingly-contacting side edge 30C of the insert pin 30 contacts to the box pin 40. Here, the intersecting position between the sloped box pin slidingly-contacting side edge 30C and the extension line EL is defined as an intersection point ND.

[0056] When the insert pin 30 is inserted to the zip tooth guide passages 50T, 60T of the upper slider 50 and the lower slider 60, a section of the insert pin 30 at the vicinity of the intersection point ND becomes to a facing area which faces to the guide column 60D of the lower slider 60. Further, as illustrated in FIG. 3, the side face of the first sloped section 30E, especially the side face at the facing area (when viewing the slide fastener 10 from T-

direction), is formed into a curved face shape continuously curved to be gradually apart from the box pin 40 toward the insert pin top end. Here, for example, it is also possible that the side face of the first sloped section 30E is formed into a flat face shape inflected at a predetermined angle or larger against the planar section of box pin slidingly-contacting side edge 30C or a face shape inflected in a multistep manner at a plurality of inflection parts, instead of being formed into the curved shape.

[0057] As illustrated in FIGS. 3 to 5, a plate-shaped first engaging portion 34 of which engaging face is oriented to the downward direction (D-direction) is formed at an upper part (i.e., apart at U-direction) of the box pin slidingly-contacting side edge 30C of the insert pin 30. The first engaging portion 34 is a section to stop the insert pin 30 at the lowermost end as being engaged with the above-mentioned second engaging portion 44 of the box pin 40 when the insert pin 30 once removed is inserted into the zip tooth guide passages 50T, 60T of the upper slider 50 and the lower slider 60 located at the lowermost end.

[0058] A first engaging guide piece 32 obtained by extending the top wall 30T to be a triangle in a planar view along the first engaging portion 34 is formed at the box pin slidingly-contacting side edge 30C of the insert pin 30. A guide face 33 connecting the first engaging portion 34 with the box pin slidingly-contacting side edge 30C is formed at the end edge of the first engaging guide piece 32 at the box pin 40 side. The guide face 33 has a shape of which dimension in the width direction is gradually increased toward the upward direction (U-direction). The guide face 33 is formed as a guide face which opens the lower end part of the insert pin 30 in the left direction (L-direction) as slidingly-contacting on the guide column 60D of the lower slider 60 when the lower slider 60 is slid in the upward direction (U-direction) from the lowermost end.

[0059] Here, since the first engaging guide piece 32 is a section formed as extending the top wall 30T, the second engaging guide piece 42 of the box pin 40 is accommodated at the back face side (i.e., in B-direction) of the first engaging guide piece 32 when the insert pin 30 and the box pin 40 are inserted into the zip tooth guide passages 50T, 60T of the upper slider 50 and the lower slider 60.

[0060] Further, to avoid interference between the tip part of the second engaging guide piece 42 protruding toward the insert pin 30 side and the box pin slidingly-contacting side edge 30C at the insert pin 30 side, a clearance groove 36 is formed at a section of the box pin slidingly-contacting side edge 30C of the insert pin 30 surrounded by the first engaging guide piece 32 and the first engaging portion 34. Here, the first engaging guide piece 32 also has a function to reinforce the first engaging portion 34 extending from the box pin slidingly-contacting side edge 30C of the insert pin 30. Further, a coupling protrusion 38 to be coupled with an engaging concave portion formed at a coupling head of the second zip tooth 13 at the lowermost end of the second zip teeth 13 row is formed on an upper face of the first engaging portion 34 of the insert pin 30 at the first zip teeth 12 row side.

[0061] In the insert pin 30 of the embodiment illustrated in the side view of FIG. 4, a pawl guide sloped face 39 is formed by sloping the top wall 30T to the back wall 30B side gradually toward the top end part of the insert pin 30. As described later with reference to FIG. 7, the pawl guide sloped face 39 is a sloped face formed for performing smooth insertion operation as pushing off the locking pawl 64 (see FIG. 2) of the lower slider 60 which functions as a slider with an automatic stop device to the top face side (i. e. , in T-direction) when the insert pin 30 once removed is to be inserted into the zip tooth guide passage 60T of the lower slider 60.

[0062] FIG. 2 illustrates a state that the lower slider 60 is lowered to the lowermost end as performing coupling between the first zip teeth 12 row and the second zip teeth 13 row by sliding the lower slider 60 to the downward direction (D-direction) from a state illustrated in FIG. 1. As illustrated in FIGS. 1 and 2, the top end of the insert pin 30 and the top end of the box pin 40 of the reverse opening slide fastener 10 are capable of being inserted to the shoulder opening side from the rear opening side tip portion of the guide column 60D of the lower slider 60 and are to be approximately at the same position in the longitudinal direction of the reverse opening slide fastener 10.

[0063] With the above structure, appearance can be corrected to be bilaterally symmetric by aligning height of the right and left (i.e., R-L direction) of the first fastener stringer 16 and the second fastener stringer 17. Further, since the guide column 60D of the lower slider 60 is introduced without having interference against the insert pin 30 and the box pin 40 when sliding the lower slider 60 in the upward direction (U-direction), the lower slider 60 can be smoothly slid.

[0064] Further, as illustrated in FIG. 2, when the insert pin 30 and the box pin 40 are set to be appropriately short, the top end part of the insert pin 30 and the top end part of the box pin 40 can be concealed as being accommodated in the zip tooth guide passage 60T of the lower slider 60 in a state that the lower slider 60 is lowered to the lowermost end in the downward direction (D-direction). Accordingly, appearance of the reverse opening slide fastener 10 can be tidied in a state that the lower slider 60 is lowered to the lowermost end.

[0065] Next, states of procedure to re-insert the insert pin 30 once removed to the upper slider 50 and the lower slider 60 will be described with reference to FIGS. 6 to 10. FIG. 6 is a planar sectional view illustrating a state that the insert pin 30 once removed is inserted through the shoulder opening of the left side (L-side) of the upper slider 50 and that the top end part of the insert pin 30 is slid toward the downward direction (D-direction) in the zip tooth guide passage 60T of the lower slider 60. FIG. 7 is a side view of the state illustrated in FIG. 6 viewing from the box pin 40 side being a view on arrow VII-VII of

FIG. 6.

[0066] FIG. 8 is a view illustrating a state that the vicinity of the top end part of the insert pin 30 is faced to the guide column 60D of the lower slider 60 with further inserting of the insert pin 30 from the state of FIG. 6. FIG. 9 is a planar sectional view illustrating as enlarging the vicinity of the top end part of the insert pin 30 and the section of the guide column 60D of FIG. 8. FIG. 10 is a planar sectional view illustrating a state that the insert pin 30 is inserted to the lowermost end. Here, the same reference numeral is given to the same section as that described with reference to FIGS. 1 to 5 and description thereof is ommited.

[0067] First, the structure of the upper slider 50 will be described with reference to FIGS. 6 to 9. As illustrated in FIGS. 6 to 9, the guide column 50D is arranged to as standing from the center part in the right-left direction (R-L direction) of an upper part (i.e., a part in U-direction) at the back blade 53 which forms a bottom portion of the upper slider 50. The guide column 50D has a tip at the rear opening side thereof. Further, the guide column 50D has a sloped face of which thickness in the width direction is gradually increased from the tip toward the shoulder opening and a sloped face of which thickness in the width direction is gradually decreased at the shoulder opening side via an inflection point. In addition, a top blade (not illustrated) is formed at the top face side (in T-direction) of the guide column 50D. A tab (not illustrated) to be operated by a user is swingably arranged at the top face (in T-direction) of the top blade.

[0068] Right and left flanges 50F are formed toward the opposing blades fromboth right and left (R-L direction) side edge sections of the top blade and back blade 53 of the upper slider 50. The zip tooth guide passage 50T to which a right-and-left pair of the first zip teeth 12 row and the second zip teeth 13 row are inserted is formed at the inside of the slider surrounded by the top blade, the back blade 53 and the flanges 50F as being a Y-shaped space in a planar view.

[0069] A locking pawl 54 (see FIGS. 6 and 8) functioning for a slider with an automatic stop device is protruded from the top blade into the zip tooth guide passage 50T as being capable of advancing and retreating. The locking pawl 54 fixes the position of the upper slider 50 by being inserted to a gap of the first zip teeth 12 row or the second zip teeth 13 row which are in a coupled state with automatic advancing into the zip guide passage 50T owing to an action of biasingmeans (not illustrated), for example, when the tab is released by the user. Further, when the tab is pulled with user's operation, the locking pawl 54 is pulled up from the zip tooth guide passage 50T against urging force of the biasing means. Then, the locking pawl 54 comes out from the gap of the first zip teeth 12 row or the second zip teeth 13 row, so that the upper slider 50 which is fixed becomes into a slidable state.

[0070] The shoulder opening of the zip tooth guide passage 50T is opened respectively at both sides of right and left (R-L direction) of the guide column 50D of the upper slider 50. The rear opening of the zip tooth guide passage 50T is opened at a lower part (i.e., a part in D-direction) of the upper slider 50. A tape insertion passage is formed at the end edge section of the flange 50F along the end edge of the flange 50F. The tape insertion passage is a section on which the fastener tape 11 slides at the time of sliding the upper slider 50 as being a gap through which the fastener tape 11 attached with the first zip teeth 12 row and the second zip teeth 13 row having the zip tooth guide passage 50T inserted passes.

[0071] When the upper slider 50 is slid in the upward direction (U-direction) in FIG. 1 in a state that the first zip teeth 12 row and the second zip teeth 13 row at right and left are inserted into the zip tooth guide passage 50T, the first zip teeth 12 row and the second zip teeth 13 row which are in a separated state are introduced from the shoulder openings at right and left (R-L direction) of the upper slider 50. The introduced first and second zip teeth 12, 13 rows are ejected from the rear opening at the downward direction (D-direction) of FIG. 1 in a coupled state as being merged by being guided along the inner wall of the flange 50F of the zip tooth guide passage 50T.

[0072] Further, when the upper slider 50 is slid in the downward direction (D-direction) in FIG. 1, the first zip teeth 12 row and the second zip teeth 13 row in a coupled state are introduced from the rear opening. The introduced first and second zip teeth 12, 13 rows in a coupled state are separated in the right and left direction (R-L direction) along the guide column 50D and ejected from the both shoulder openings in the upward direction (U-direction) in FIG. 1.

[0073] Next, the structure of the lower slider 60 will be described with reference to FIGS. 6 to 10. As illustrated in FIGS. 6 to 10, the guide column 60D is arranged as standing from the center part in the right-left direction (R-L direction) of a lower part (i.e., a part in D-direction) at the back blade 63 which forms a bottom portion of the lower slider 60. The guide column 60D has a tip at the rear opening side thereof. Further, the guide column 60D has a sloped face of which thickness in the width direction is gradually increased from the tip toward the shoulder opening and a sloped face of which thickness in the width direction is gradually decreased at the shoulder opening side via an inflection point. In addition, a top blade 62 (see FIG. 7) is formed at the top face side (in T-direction) of the guide column 60D. A tab (not illustrated) to be operated by a user is swingably arranged at the top face (in T-direction) of the top blade 62.

[0074] Right and left flanges 60F are formed extending toward the opposing blades from both right and left (R-L direction) side edge sections of the top blade 62 and the back blade 63 of the lower slider 60. The zip tooth guide passage 60T to which the right-and-left pair of the first zip teeth 12 row and the second zip teeth 13 row are inserted is formed at the inside of the slider surrounded by the top blade 62, the back blade 63 and the flanges 60F as being a Y-shaped space in a planar view.

[0075] A locking pawl 64 (see FIGS. 6 to 10) functioning for a slider with an automatic stop device is protruded from the top blade 62 into the zip tooth guide passage 60T as being capable of advancing and retreating. The locking pawl 64 fixes the position of the lower slider 60 by being inserted to a gap of the first zip teeth 12 row or the second zip teeth 13 row which are in a coupled state with automatic advancing into the zip guide passage 60T owing to an action of biasingmeans (not illustrated), for example, when the tab is released by the user. Further, when the tab is pulled with user' s operation, the locking pawl 64 is pulled up from the zip tooth guide passage 60T against biasing force of the biasing means. Then, the locking pawl 64 comes out from the gap of the first zip teeth 12 row or the second zip teeth 13 row, so that the lower slider 60 which is fixed becomes into a slidable state.

[0076] The shoulder opening of the zip tooth guide passage 60T is opened respectively at both sides of right and left (R-L direction) of the guide column 60D of the upper slider 60. The rear opening of the zip tooth guide passage 60T is opened at an upper part (i.e., a part in U-direction) of the lower slider 60. A tape insertion passage is formed at the end edge section of the flange 60F along the end edge of the flange 60F. The tape insertion passage is a section on which the fastener tape 11 slides at the time of sliding the lower slider 60 as being a gap through which the fastener tape 11 attached with the first zip teeth 12 row and the second zip teeth 13 row having the zip tooth guide passage 60T inserted passes.

[0077] Regarding the upper slider 50 and the lower slider 60 of the reverse opening slide fastener 10, the lower slider 60 is arranged closer to the insert pin 30 and the box pin 40 than the upper slider 50 as described above, in a state that the first zip teeth 12 row and the second zip teeth 13 row are inserted respectively into the zip tooth guide passages 50T, 60T. Further, the rear opening of the upper slider 50 is faced to the rear opening of the lower slider 60.

[0078] When the lower slider 60 is slid in the upward direction (U-direction) in FIG. 1, the first zip teeth 12 row and the second zip teeth 13 row in a coupled state are introduced from the rear opening. The introduced first and second zip teeth 12, 13 rows in a coupled state are separated in the right and left direction (R-L direction) along the guide column 60D and ejected from the both shoulder openings in the downward direction (D-direction) in FIG. 1.

[0079] Further, when the lower slider 60 is slid in the downward direction (D-direction) in FIG. 1 in a state that the first zip teeth 12 row and the second zip teeth 13 row at right and left are inserted into the zip tooth guide passage 60T, the first zip teeth 12 row and the second zip teeth 13 row which are in a separated state are introduced from the shoulder openings at right and left (R-L direction) of the lower slider 60. The introduced first and second zip teeth 12, 13 rows are ejected from the rear opening at the upward direction (U-direction) of FIG. 1 in a coupled state as being merged by being guided along the inner wall of the flange 50F of the zip tooth guide passage 60T.

[0080] When the lower slider 60 is further lowered in the downward direction (D-direction), the box pin 40 and the insert pin 30 are introduced from the shoulder opening of the lower slider 60, and then, the lower slider 60 is stopped as the shoulder portion thereof being contacted to the stopper 4 6 which is formed at the lower end of the box pin 40. This is the position for the lower slider 60 to be the lowermost end.

[0081] To release entire coupling between the first zip teeth 12 row and the second zip teeth 13 row at right and left, lowering of the upper slider 50 in the downward direction (D-direction) is further performed to a position where the rear portion of the upper slider 50 is contacted to the rear portion of the lower slider 60 in a state that the lower slider 60 is moved to the lowermost end. Then, coupling between the first zip teeth 12 row and the second zip teeth 13 row is entirely to be released. Subsequently, lifting of the insert pin 30 in the upward direction (U-direction) is performed while holding the reinforcement film 24 portion at the lower end of the first fastener stringer 16 in the above state. Then, the insert pin 30 can be pulled out from the zip tooth guide passages 50T, 60T of the upper slider 50 and the lower slider 60. Accordingly, the first fastener stringer 16 and the second fastener stringer 17 at right and left can be separated.

[0082] To re-couple the first fastener stringer 16 and the second fastener stringer 17 at right and left from a state of being once separated, inserting of the insert pin 30 is performed from the shoulder opening in the left direction (L-direction) of the upper slider 50 while holding the reinforcement film 24 portion at the lower end of the first fastener stringer 16. FIG. 6 illustrates a state that the top end part of the insert pin 30 is slid in the downward direction (D-direction) in the zip tooth guide passage 60T of the lower slider 60 as the insert pin 30 being inserted from the shoulder opening of the upper slider 50.

[0083] In a case that the insert pin 30 is to be inserted further deeply in a state of FIG. 6, the insert pin 30 is moved in the downward direction (D-direction) while the flange slidingly-contacting side edge 30F of the insert pin 30 is slidingly contacted to the flange 50F of the upper slider 50 and the guide face 33 of the insert pin 30 is slidingly contacted to the guide column 50D of the upper slider 50.

[0084] In a case that the insert pin 30 is to be inserted further deeply from the state of FIG. 6, the locking pawl 64 is contacted to the top wall 30T at the top end part of the insert pin 30. The pawl guide sloped face 39 as gradually sloping the top wall 30T toward the back wall 30B side to gradually decrease thickness of the insert pin 30 is formed at the top end part of the insert pin 30 and the locking pawl 64 is contacted to the pawl guide sloped face 39. When the insert pin 30 is further inserted in the downward direction (D-direction) in a state that the locking pawl 64 is contacted to the pawl guide sloped face 39, the locking pawl 64 is retracted toward the top face

side (T-direction) while the locking pawl 64 is slid on the pawl guide face 39 of the insert pin 30 (see FIG. 7). Accordingly, the top end part of the insert pin 30 can pass through the section of the lower slider 60 where the locking pawl 64 is protruded and the insert pin 30 can be inserted further in the downward direction (D-direction).

[0085] In this case, as illustrated in FIG. 7, the top end of the insert pin 30 having the pawl guide sloped face 39 is formed as being deviated to the back wall 30B side against the center line of the insert pin 30 in the top-back direction. Further, the top end of the insert pin 30 is located at the back face side (B-direction) from the protruded end of the locking pawl 64 in a state that the locking pawl 64 is protruded to the zip tooth guide passage 60T.

[0086] Specifically, the pawl guide sloped face 39 is formed continuously to a section where the first sloped section 30E is formed. That is, the pawl guide sloped face 39 is formed to cross over the extension line EL and is arranged at the top face side of the first sloped section 30E which crosses over the extension line EL. Accordingly, the surface at the top end part of the insert pin 30 is shaped spherical in combination with the pawl guide sloped face 39 and the curved face of the first sloped section 30E. With the above structure, even if the insertion of the insert pin 30 is performed linearly or along with rotation when inserting the insert pin 30, for example, the locking pawl 64 of the lower slider 60 can be guided to the top face side (T-direction) as being reliably contacted to the pawl guide sloped face 39 and the locking pawl 64 can be stably retracted.

[0087] In a case that the insert pin 30 is to be further inserted as being advanced straightly form the state of FIGS. 6 and 7, the first sloped section 30E at the box pin slidingly-contacting side edge 30C side of the top end part of the insert pin 30 is faced to the guide column 60D of the lower slider 60 as illustrated in FIGS. 8 and 9. At that time, the flange slidingly-contacting side edge 30F of the insert pin 30 is contacted to the flange 50F of the upper slider 50. The box pin slidingly-contacting side edge 30C of the insert pin 30 is contacted to the opposing side edge 40C of the box pin 40 and is faced to the guide column 60D of the lower slider 60 as being slightly apart from the guide column 60D. Here, the box pin slidingly-contacting side edge 30C of the insert pin 30 may be contacted to the guide column 60D of the lower slider 60.

[0088] A part of the box pin slidingly-contacting side edge 30C of the insert pin 30 being closest to the guide column 60D of the lower slider 60 is defined as a close point CP. The facing area denotes the curve-shaped area of the box pin slidingly-contacting side edge 30C of the insert pin 30 to be faced to the guide column 60D of the lower slider 60 when the insert pin 30 is to be inserted into the zip tooth guide passages 50T, 60T of the upper slider 50 and the lower slider 60.

[0089] Specifically, the facing area denotes an area of the box pin slidingly-contacting side edge 30C from a contact point thereof with the opposing side edge 40C toward the top end of the insert pin 30 when the box pin slidingly-contacting side edge 30C is in a state that the flange slidingly-contacting side edge 30F of the insert pin 30 is contacted to the flange 50F of the upper slider 50 and the box pin slidingly-contacting side edge 30C is contacted to the opposing side edge 40C as the insert pin 30 being inserted as illustrated in FIG. 8.

[0090] Further, opposing or facing between the box pin slidingly-contacting side edge 30C and the guide column 60D denotes that the face of the box pin slidingly-contacting side edge 30C of the insert pin 30 and the wall face in the top-back direction (T-B direction) of the guide column 60D are mutually faced not denoting a case that the faces are at a right angle. Here, the insert pin 30 and the guide column 60D are mutually faced in a state of being apart. However, the bothmay be mutually contacted. Further, the close point CP in the embodiment illustrated in FIGS. 8 and 9 is located closer to the box pin 40 side than the intersection point ND.

[0091] With the reverse opening slide fastener 910 in the related art (see FIG. 12), it has been required to insert the insert pin 930 while a user intentionally rotates the reinforcing film 24 at the low end of the first fastener stringer 916 so that the top end wall 930D of the insert pin 930 is not contacted to the guide column 60D. In other words, with the conventional reverse opening slide fastener 910, there has been a problem that insertion of the insert pin 930 is disturbed owing to collision of the top end wall 930D of the insert pin 930 with the guide column 60D in a case that the insert pin 930 is inserted so that the flange slidingly-contacting side edge 930F of the insert pin 930 is contacted to the flange 50F of the upper slider 50 and the opposing side edge (i.e., the box pin slidingly-contacting side edge) 930C of the insert pin 30 is contacted to the opposing side edge of the box pin 40.

[0092] In contrast, according to the invention, as illustrated in FIGS. 8 and 9, the first sloped section 30E of the box pin slidingly-contacting side edge 30C at the top end part side of the insert pin 30 is formed at the sloped face (i.e. , the curved face) sloped in the direction being apart from the box pin 40 side toward the top end part of the insert pin 30. That is, the top end part of the insert pin 30 is formed at the sloped face which is gradually sloped to the flange slidingly-contacting side edge 30F side toward the top end part. Then, the sloped face is formed as defining positional relation against the guide column 60D so that the sloped face becomes the facing area which is faced to the guide column 60D of the lower slider 60.

[0093] That is, the sloped face of the first sloped section 30E is formed to be a shape sloped at an angle being apart from the guide column 60D of the lower slider 60 in a state that the flange slidingly-contacting side edge 30F of the insert pin 30 is slidingly contacted to the flange 50F of the upper slider 50 and the box pin slidingly-contacting side edge 30C of the insert pin 30 is slidingly contacted to the opposing side edge 40C of the box pin 40. Here, the sloped face of the first sloped section 30E may be formed to be a shape sloped at an angle to be con-

tacted to the side face of the guide column 60D at the insert pin side. With the above structure of the insert pin 30 having the first sloped section 30E, it is possible to prevent the top end of the insert pin 30 from being contacted to the guide column 60D of the lower slider 60, and further, to prevent the facing area of the insert pin 30 from being contacted to the guide column 60D. Accordingly, insert pin insertion operation can be smoothly performed.

[0094] Further, in this case, the insert pin 30 is structured so that distance (i.e., length) between the contact point of the box pin slidingly-contacting side edge 30C with the box pin 40 and the intersection point ND as being intersected with the extension line EL of the box pin slidingly-contacting side edge 30C is larger than distance (i.e., length) between the contact point and the tip of the guide column 60D of the lower slider 60. In addition, the side face of the first sloped section 30E of the insert pin 30 is formed into a continuously curved shape. Accordingly, it is possible to reliably avoid contacting of the insert pin 30 with the guide column 60D of the lower slider 60 and insert pin insertion operation can be performed more reliably.

[0095] Further, the second sloped section 30G formed at the flange slidingly-contacting side edge 30F side of the insert pin 30 is formed to have more gradual sloped angle variation than that of the first sloped section 30E as described above. Accordingly, the second sloped section 30G of the insert pin 30 is not contacted to the flange 60F of the lower slider 60 when the insert pin 30 is inserted.

[0096] Here, when the insert pin 30 is inserted as being slightly rotated at the time of insertion of the insert pin 30 from the shoulder opening of the upper slider 50, for example, there may be a case that the box pin slidingly-contacting side edge 30C of the insert pin 30 is not slidingly contacted to the opposing side edge 40C of the box pin 40 even with sliding contact of the flange slidingly-contacting side edge 30F of the insert pin 30 with the flange 50F of the upper slider 50. In this case, similarly to the related art, it is possible to smoothly perform insert pin insertion operation as avoiding collision of the top end of the insert pin 30 with the guide column 60D of the lower slider 60.

[0097] Subsequently, when the insert pin 30 is further inserted in the downward direction (D-direction) from the state of FIGS. 8 and 9, the insert pin 30 can be smoothly inserted to the lowermost end as illustrated in FIG. 10 with gradual rotation of the insert pin 30 to be parallel to the box pin 40. Here, not illustrated in FIG. 10, positioning of the insert pin 30 at the lowermost end canbe performed owing to contact of the first engaging portion 34 (see FIG. 3) of the insert pin 30 with the second engaging portion 44 (see FIG. 3) of the box pin 40. Here, the insert pin 30 being parallel to the box pin 40 denotes that the planar section of the box pin slidingly-contacting side edge 30C of the insert pin 30 or the planar section of the flange slidingly-contacting side edge 30F and the opposing side edge 40C of the box pin 40 are parallel to each other.

[0098] As described above, with the reverse opening slide fastener 10 of the invention, the insert pin 30 can be stably inserted to the lowermost end position as reliably avoiding collision of the top end of the insert pin 30 with the guide column 60D of the lower slider 60 even when insert pin insertion is performed at an angle to cause collision of the insert pin top end with the guide column of the lower slider in the related art.

[0099] In a state of FIG. 10, the top end part of the insert pin 30 and the top end part of the box pin 40 of the reverse opening slide fastener 10 are to be approximately at the same position in the longitudinal direction of the reverse opening slide fastener 10. Here, in the state of FIG. 10, the top end of the insert pin 30 is located at a position being lower than the tip (i. e. , the tip at the rear opening side) in the upward direction (U-direction) of the guide column 60D of the lower slider 60 by an amount of dimension DP to the insert pin lower end position in the downward direction (D-direction).

[0100] Since the top end of the insert pin 30 is located in the downward direction (D-direction) below the guide column 60D of the lower slider 60, it becomes easy to orient the top end part of the inert pin 30 in a direction toward the shoulder opening of the lower slider 60 at the time when the lower slider 60 is slid from the lowermost end toward the upward direction (U-direction). Accordingly, opening operation can be smoothly performed. Here, in a state that the lower slider 60 and the insert pin 30 are located at the lowermost end, the top end part of the insert pin 30 and the top end part of the box pin 40 are concealed in the zip tooth guide passage 60T of the lower slider 60.

[0101] Zip teeth made of metal or resin can be used as the first and second zip teeth 12, 13 of the above mentioned slide fastener 10. Further, it is also possible that coil-shaped zip teeth obtained by winding a line-shaped monofilament into a coil shape can be sewn to a fastener tape. Zip teeth which can be usually used for a slide fastener can be adopted in the invention.

INDUSTRIAL APPLICABILITY

[0102] The invention can be applied to a reverse opening slide fastener capable of performing upper opening and reverse opening and capable of separating and fitting by insertion. Such a reverse opening slide fastener can be utilized for right front and left front bodies of a jacket and a long coat, sportswear and others.

DESCRIPTION OF REFERENCE NUMERALS

[0103]

10, 910 Reverse opening slide fastener
11 Fastener tape
12 First zip tooth
13 Second zip tooth

14 Core portion
16, 916 First fastener stringer
17 Second fastener stringer
18 Top stopper
22 Separable bottom end stop
24 Reinforcement film
30, 930 Insert pin
30C Box pin slidingly-contacting side edge
30E First sloped section
30F, 40F, 930F Flange slidingly-contacting side edge
30G Second sloped section
30T Top wall
30B Back wall
32 First engaging guide piece
33, 43 Guide face
34 First engaging portion
36 Clearance groove
37, 937 Column guide sloped face
38 Coupling protrusion
39 Pawl guide sloped face
40 Box pin
40C, 930C Opposing side edge
42 Second engaging guide piece
44 Second engaging portion
46 Stopper
50 Upper slider
50D, 60D Guide column
50F, 60F Flange
50T, 60T Zip tooth guide passage
53, 63 Back blade
54, 64 Locking pawl
60 Lower slider
62 Top blade
64 Locking pawl
930D Top end wall
CP Close point
DP Dimension between upper tip of guide column to lowermost position of insert pin
EL Extension line
ND Intersection point

Claims

1. A reverse opening slide fastener in which upper and lower sliders (50, 60) are arranged having rear openings mutually opposed and in which the top end of an insert pin (30) can be inserted beyond a rear opening side tip of a guide column (60D) of a lower slider (60) when the insert pin (30) is inserted into the upper and lower sliders (50, 60) from a shoulder opening of the upper slider (50), including:

a right-and-left pair of first and second fastener stringers (16, 17);
the insert pin (30) and a box pin (40) which are arranged respectively at a lower end of inner side edge sections of the first and second fastener stringers (16, 17); and
the upper slider (50) and the lower slider (60) which open and close the first and second fastener stringers (16, 17);
wherein the insert pin (30) includes a side edge (30C) at the box pin (40) side and a side edge (30F) at a tape inner side being arranged opposite to the side edge (30C) at the box pin (40) side;
a first sloped section (30E) sloped in a direction to be apart from the box pin (40) toward the top end of the insert pin (30) is formed at the side edge (30C) at the box pin (40) side; and
the first sloped section (30E) is formed as being intersected, at an intersection point (ND), with an extension line (EL) obtained by extending a planar section of the side edge (30F) at a tape inner side to the top end side of the insert pin (30) and has a shape sloped at an angle to be contacted to the guide column (60D) of the lower slider (60) or to be apart from the guide column (60D) when the insert pin (30) is inserted to the upper and lower sliders (50, 60),
characterized in that
the insert pin (30) is structured so that in a state that the side edge (30F) at a tape inner side is slidingly contacted to a flange (50F) of the upper slider (50) and the side edge (30C) at the box pin (40) side is slidingly contacted to an opposing side edge (40C) of the box pin (40), a distance between a contact point of the side edge (30C) at the box pin (40) side with the box pin (40) and the intersection point (ND) is larger than a distance between the contact point and a tip of the guide column (60D).

2. The reverse opening slide fastener according to claim 1, being **characterized in that** a side face of the first sloped section (30E) of the side edge (30C) at the box pin (40) side is formed into a continuously curved shape.

3. The reverse opening slide fastener according to claim 1,
being **characterized in that** a second sloped section (30G) sloped in a direction to be apart from the box pin (40) toward the top end of the insert pin (30) is formed at the side edge (30F) at a tape inner side being at the opposite side to the first sloped section (30E); and
a width dimension between the first sloped section (30E) at the side edge (30C) at the box pin (40) side and the second sloped section (30G) at the side edge (30F) at a tape inner side is decreased toward the top end of the insert pin (30).

4. The reverse opening slide fastener according to

claim 1,
being **characterized in that** the lower slider (60) includes top and back blades (62, 63) which are connected by the guide column (60D) and a stopper pawl (64) which is arranged at one of the top and back blades (62, 63);
a pawl guide sloped face (39) which is sloped to gradually decrease thickness of the insert pin (30) toward the insert pin top end is formed at a surface of the top end part of the insert pin (30) at the stopper pawl (64) side; and
the pawl guide sloped face (39) is formed as crossing over the extension line (EL).

Patentansprüche

1. Umgekehrt öffnender Reissverschluss, bei dem ein oberer und ein unterer Schieber (50, 60) mit einander gegenüberliegenden Hinteröffnungen angeordnet sind, und wobei das Spitzenende eines Einsteckteils (30) über eine einer Hinteröffnung des Schiebers zugewandte Spitze eines Schieberkeils (60D) eines unteren Schiebers (60) hinaus eingeführt werden kann, wenn das Einsteckteil (30) von einer Schulteröffnung des oberen Schiebers (50) aus in den oberen und den unteren Schieber (50, 60) eingeführt wird, umfassend:

   ein Paar aus einer linken und einer rechten Reissverschlusskette (16, 17);
   das Einsteckteil (30) und ein Kastenteil (40), welche jeweils an einem unteren Ende von inneren Seitenkantenabschnitten der ersten und der zweiten Reissverschlusskette (16, 17) angeordnet sind; und
   den oberen Schieber (50) und den unteren Schieber (60), welche die erste und die zweite Reissverschlusskette (16, 17) öffnen und schließen;
   wobei das Einsteckteil (30) eine Seitenkante (30C) an der dem Kastenteil (40) zugewandten Seite und eine Seitenkante (30F) an einer Bandinnenseite, die entgegengesetzt zu der dem Kastenteil (40) zugewandten Seitenkante (30C) angeordnet ist, umfasst;
   einen an der Seitenkante (30C) an der dem Kastenteil (40) zugewandten Seite ausgebildeten ersten geneigten Bereich (30E), der auf das Spitzenende des Einsteckteils (30) zu in einer Richtung geneigt ist, so dass er von dem Kastenteil (40) beabstandet ist;
   der erste geneigte Bereich (30E) derart ausgebildet ist, dass er an einem Schnittpunkt (ND) eine Verlängerungslinie (EL), welche durch Verlängerung eines ebenen Bereichs der Seitenkante (30F) an einer Bandinnenseite zu der Spitzenendseite des Einsteckteils (30) erhalten wird, schneidet, und eine Form aufweist, die in einem Winkel geneigt ist, so dass sie mit dem Schieberkeil (60D) des unteren Schiebers (60) in Berührung gebracht wird, oder von dem Schieberkeil (60D) beabstandet ist, wenn das Einsteckteil (30) in den oberen und unteren Schieber (50, 60) eingeführt wird,
   dadurch gekennzeichnet, dass
   das Einsteckteil (30) derart aufgebaut ist, dass in einem Zustand, in dem die Seitenkante (30F) an einer Bandinnenseite gleitend mit einem Flansch (50F) des oberen Schiebers in Berührung gelangt und die Seitenkante (30C) an der dem Kastenteil (40) zugewandten Seite gleitend mit der gegenüberliegenden Seitenkante (40C) des Kastenteils (40) in Berührung gelangt, ein Abstand zwischen einem Berührungspunkt der Seitenkante (30C) an der dem Kastenteil (40) zugewandten Seite mit dem Kastenteil (40) und dem Schnittpunkt (ND) größer ist als ein Abstand zwischen dem Berührungspunkt und einer Spitze des Schieberkeils (60D).

2. Umgekehrt öffnender Reissverschluss nach Anspruch 1,
   dadurch gekennzeichnet, dass eine Seitenoberfläche des ersten geneigten Bereichs (30E) der Seitenkante (30C) an der dem Kastenteil (40) zugewandten Seite in einer durchgehend gebogenen Form ausgebildet ist.

3. Umgekehrt öffnender Reissverschluss nach Anspruch 1,
   dadurch gekennzeichnet, dass ein zweiter geneigter Bereich (30G), der auf ein Spitzenende des Einsteckteils (30) zu in eine Richtung geneigt ist, so dass er von dem Kastenteil (40) beabstandet ist, an der Seitenkante (30F) an einer Bandinnenseite an der dem ersten geneigten Bereich (30E) entgegengesetzten Seite angeordnet ist; und
   eine Breitenabmessung zwischen dem ersten geneigten Bereich (30E) an der Seitenkante (30C) an der dem Kastenteil (40) zugewandten Seite und dem zweiten geneigten Bereich (30G) an der Seitenkante (30F) an einer Bandinnenseite auf das Spitzenende des Einsteckteils (30) zu verringert ist.

4. Umgekehrt öffnender Reissverschluss nach Anspruch 1,
   dadurch gekennzeichnet, dass der obere Schieber (60) ein Oberschild und ein Unterschild (62, 63), die durch den Schieberkeil (60D) miteinander verbunden sind, und eine Stoppkralle (64), die an dem Ober- oder dem Unterschild (62, 63) angeordnet ist, umfasst;
   eine geneigte Krallenführungsoberfläche (39), die derart geneigt ist, dass sie die Dicke des Einsteckteils (30) auf das Spitzenende des Einsteckteils zu

allmählich verringert, ist an einer Oberfläche des Spitzenendbereichs des Einsteckteils (30) an der der Stoppkralle (64) zugewandten Seite ausgebildet; und
die geneigte Krallenführungsoberfläche (39) ist derart ausgebildet, dass sie die Verlängerungslinie (EL) kreuzt.

Revendications

1. Fermeture à glissière à double curseur séparable dans laquelle un curseur supérieur et un curseur inférieur (50, 60) sont mutuellement disposés de manière à comporter des ouvertures arrière opposées et dans laquelle l'extrémité supérieure d'une broche d'insertion (30) peut être insérée au-delà d'une extrémité effilée, côté ouverture arrière, d'un pilier de guidage (60D) d'un curseur inférieur (60) lorsque la broche d'insertion (30) est insérée dans le curseur supérieur et dans le curseur inférieur (50, 60) depuis une ouverture formant épaulement du curseur supérieur (50), comprenant :

une paire d'une première et d'une deuxième demi-chaînes droite et gauche (16, 17) de fermeture à glissière,
la broche d'insertion (30) et une broche boîtier (40) qui sont disposées respectivement à l'extrémité inférieure des segments de bord latéral intérieur de la première et de la deuxième demi-chaînes de fermeture à glissière (16, 17) ; et
le curseur supérieur (50) et le curseur inférieur (60) qui ouvrent et ferment la première et la deuxième demi-chaînes (16, 17) de fermeture à glissière ;
ka broche d'insertion (30) comportant un bord latéral (30C) du côté de la broche boîtier (40) et un bord latéral (30F), du côté intérieur du ruban, étant agencés à l'opposé du bord latéral (30C) du côté de la broche boîtier (40) ; et
dans laquelle un premier segment incliné (30E) incliné dans une direction qui l'éloigne de la broche boîtier (40) en direction de l'extrémité supérieure de la broche d'insertion (30) est formé sur le bord latéral (30) du côté de la broche boîtier (40) ; et
le premier segment incliné (30E) a une forme telle qu'il est intersecté, en un point d'intersection (ND) par une ligne de prolongement (EL) obtenue en prolongeant une partie plane du bord latéral (30F) du côté intérieur du ruban vers le côté d'extrémité supérieure de la broche d'insertion (30), et il a une forme inclinée d'un certain angle afin d'être en contact avec le pilier de guidage (60D) du curseur inférieur (60) ou d'être à l'écart du pilier de guidage (60D) lorsque la broche d'insertion (30) est insérée dans le curseur supérieur et dans le curseur inférieur (50, 60),

caractérisé en ce que

la broche d'insertion (30) a une structure telle que dans un état dans lequel le bord latéral (30F), du côté intérieur du ruban, est en contact glissant avec une joue (50F) du curseur supérieur (50) et le bord latéral (30C), du côté de la broche boîtier (40), est en contact glissant avec un bord latéral opposé (40C) de la broche boîtier (40), la distance entre un point de contact du bord latéral (30C), du côté broche boîtier (40), avec la broche boîtier (40) et le point d'insertion (ND) est supérieure à la distance entre le point de contact et l'extrémité effilée du pilier de guidage (60D).

2. Fermeture à glissière à double curseur séparable selon la revendication 1 **caractérisée en ce que** la face latérale du premier segment incliné (30E) du bord latéral (30C) du côté broche boîtier (40) est réalisée avec une forme courbe continue.

3. Fermeture à glissière à double curseur séparable selon la revendication 1 **caractérisée en ce qu'**un deuxième segment incliné (30G), incliné dans une direction de manière à s'écarter de la broche boîtier (40) en direction de l'extrémité supérieure de la broche d'insertion (30), a une forme telle qu'au niveau du bord latéral (30F), du côté intérieur du ruban, il est du côté opposé au premier segment incliné (30E) ; et
en ce que la dimension en largeur entre le premier segment incliné (30E) au niveau du bord latéral (30C) du côté broche boîtier (40) et le deuxième segment incliné (30G) au niveau du bord latéral (30F) du côté intérieur du ruban décroît en direction de l'extrémité supérieure de la broche d'insertion (30).

4. Fermeture à glissière à double curseur séparable selon la revendication 1, **caractérisée en ce que** le curseur inférieur (60) comporte une plaque supérieure et une plaque arrière (62, 63) qui sont reliées par le pilier de guidage (60D) ainsi qu'un cliquet d'arrêt (64) qui est agencé sur l'une des plaques supérieure et arrière (62, 63) ;
en ce qu'une face inclinée (39) de guidage de cliquet qui est inclinée de manière à faire diminuer progressivement l'épaisseur de la broche d'insertion (30) en direction de l'extrémité supérieure de la broche d'insertion, est réalisée sur une surface de la partie extrémité supérieure de la broche d'insertion (30) du côté du cliquet d'arrêt (64) ; et
en ce qu'une face inclinée (39) de guidage de cliquet est réalisée en chevauchant la ligne de prolongement (EL).

FIG. 1

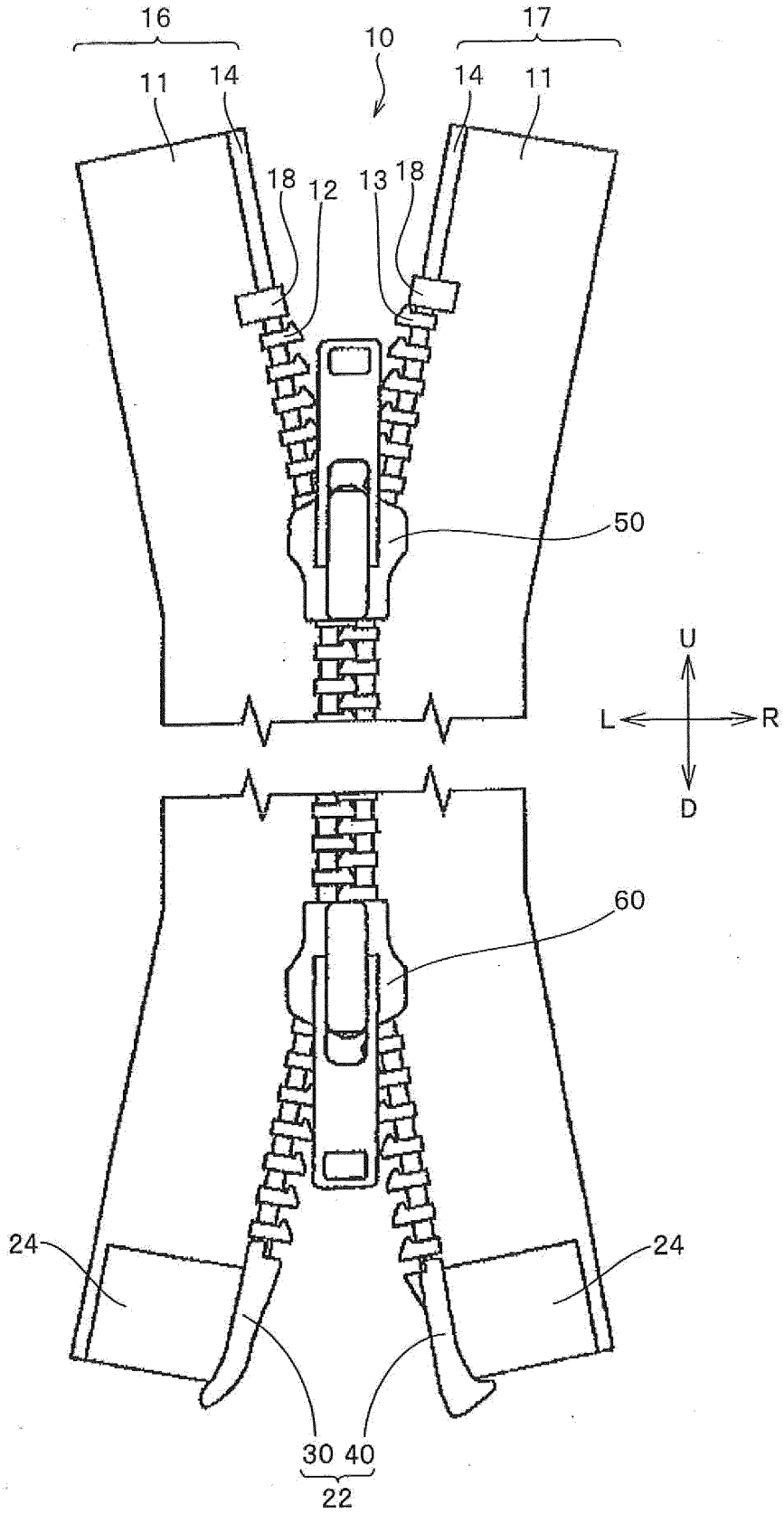


FIG. 2

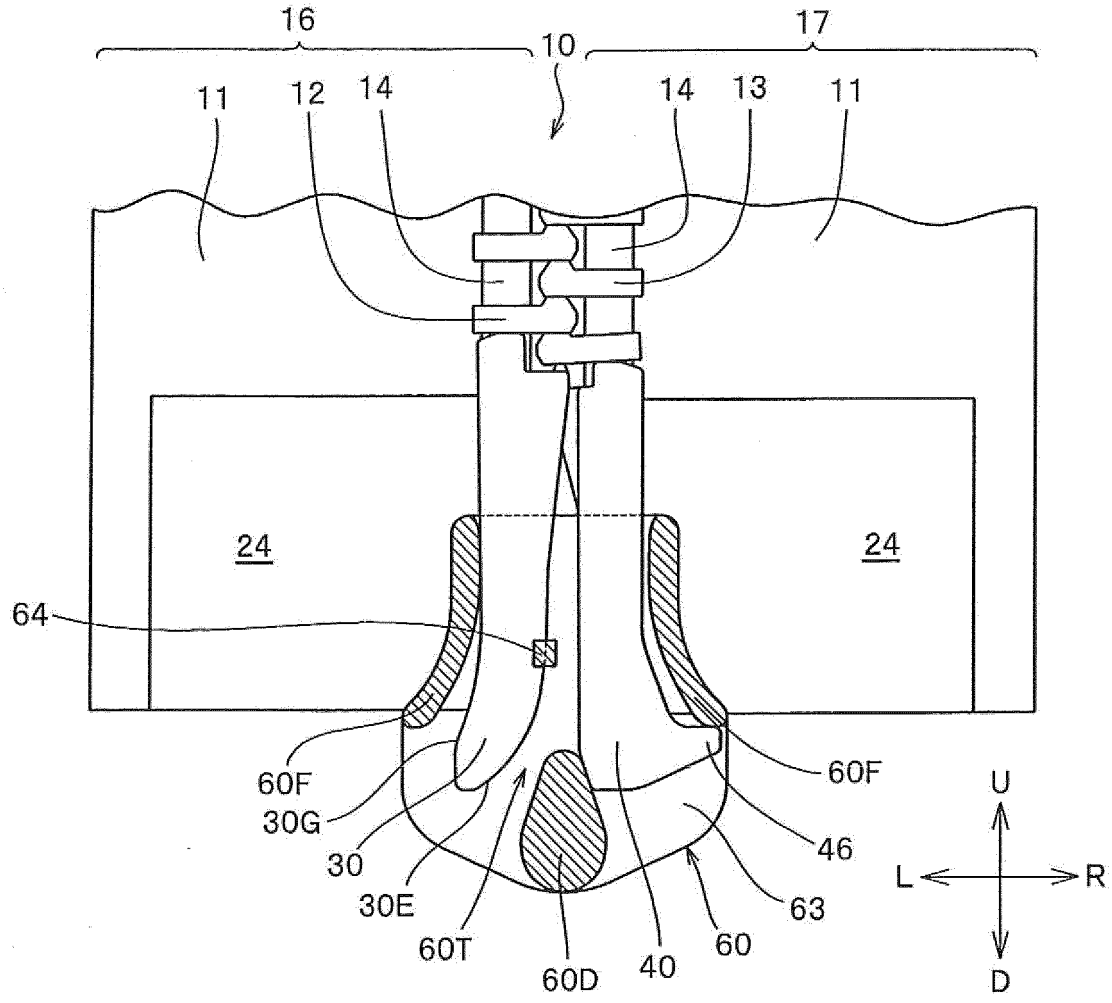

16
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24
24
64
60F
30G
30
30E
60T
60D
40
60
63
46
60F
U
L
R
D

FIG. 3

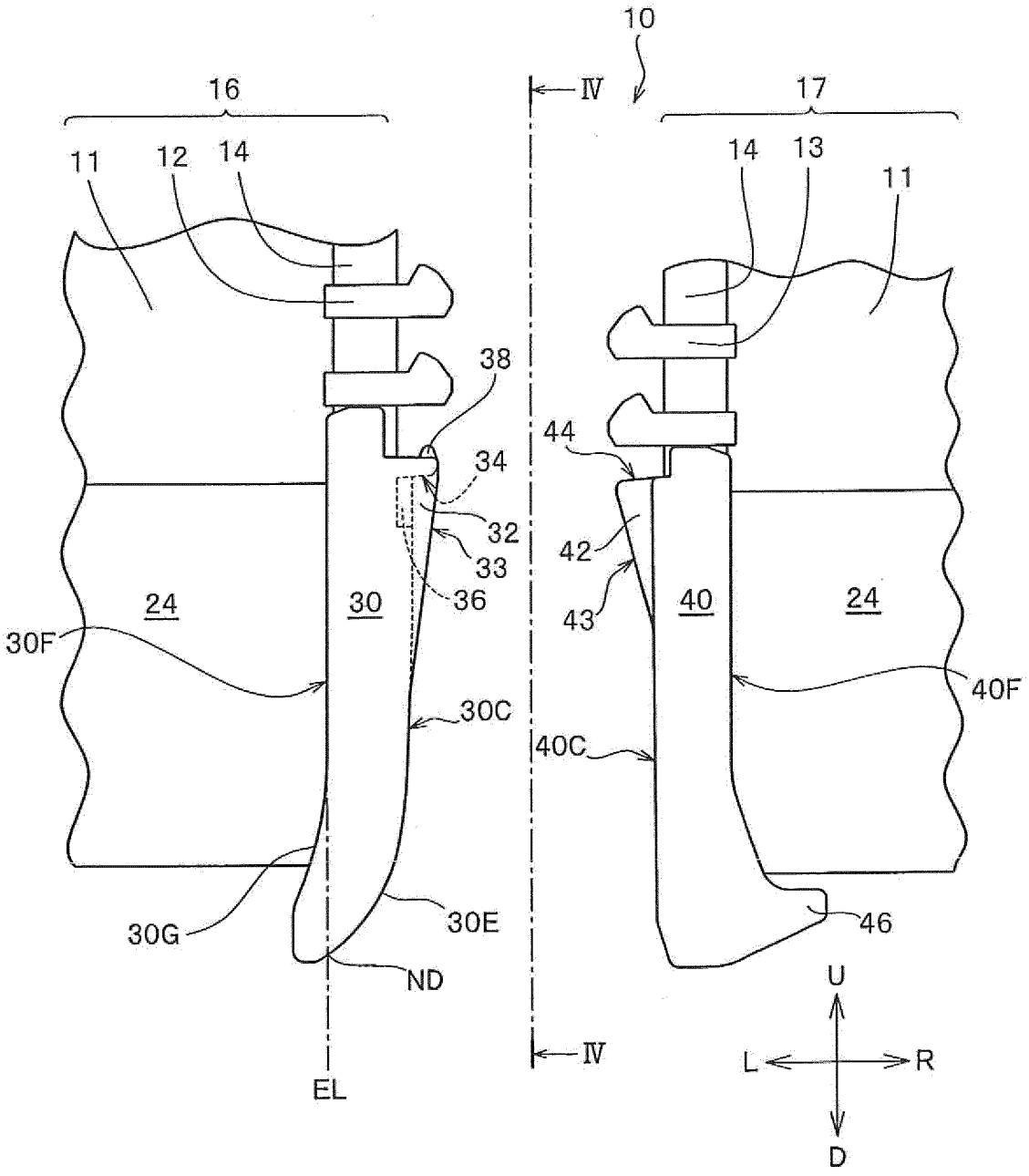

10
16
17
Ⅳ
Ⅳ
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12
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14
13
11
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44
34
32
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42
43
36
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40
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30F
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30C
40C
30G
30E
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ND
EL
U
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D

FIG. 4

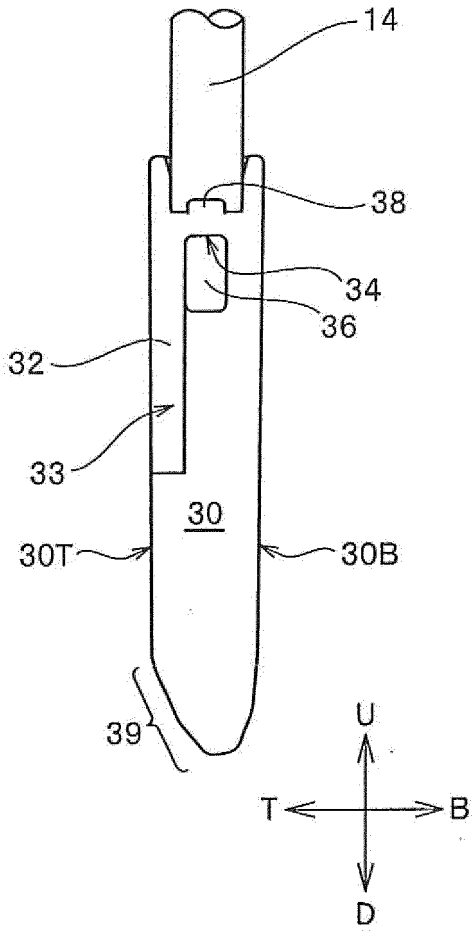


FIG. 5

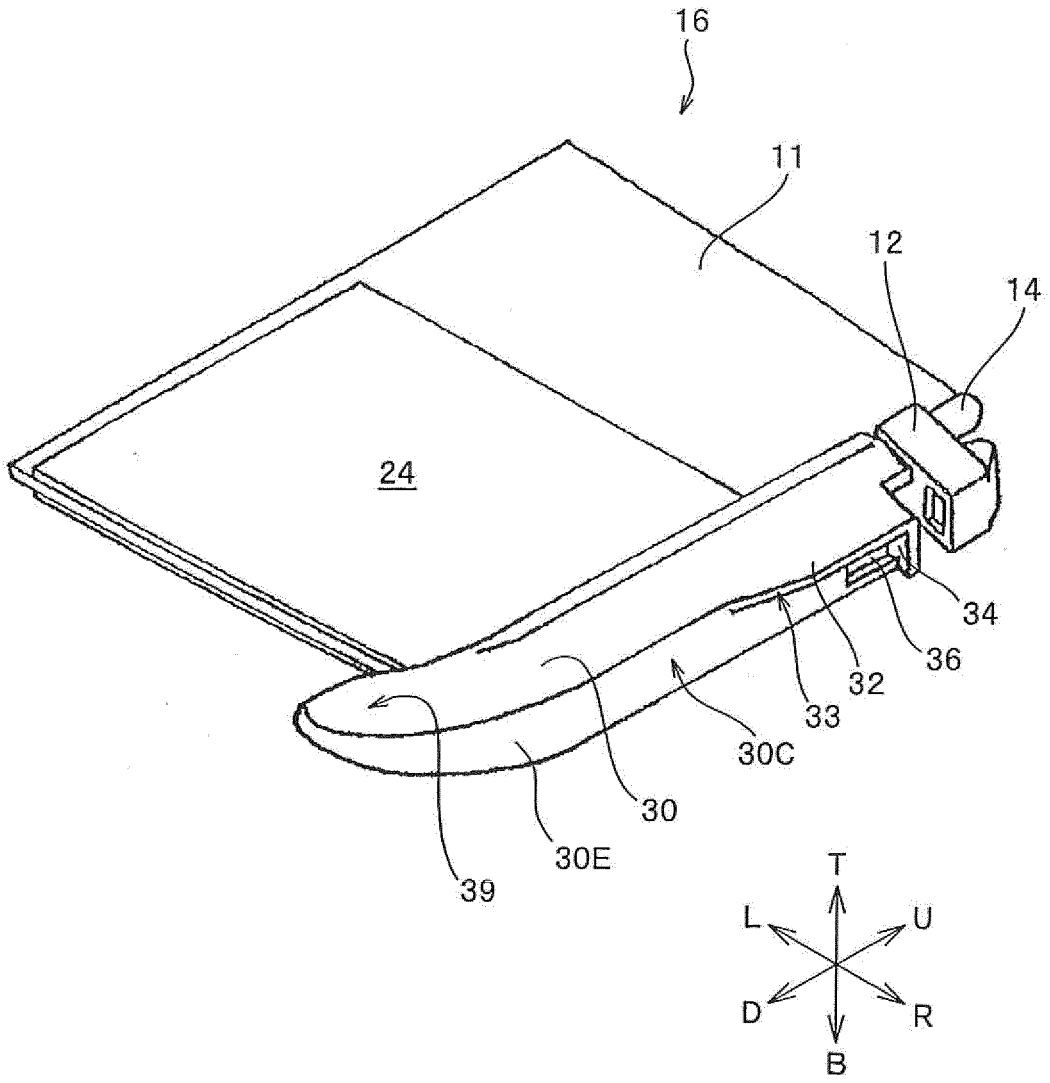


FIG. 6

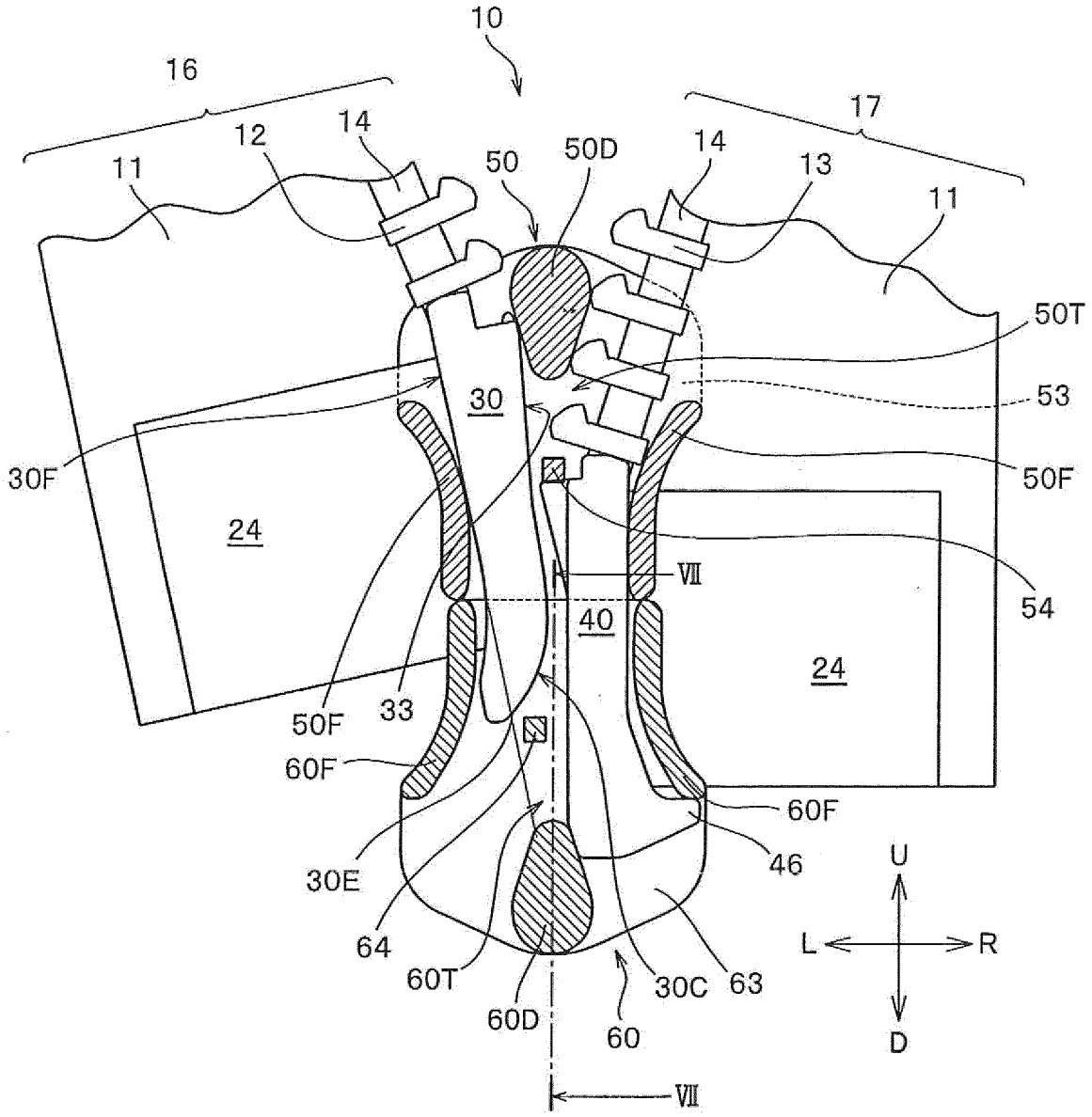

10
16
17
12
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14
11
50
50D
13
11
50T
53
30
30F
50F
24
VII
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24
50F
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60F
60F
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30E
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60T
60D
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30C
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VII

FIG. 7

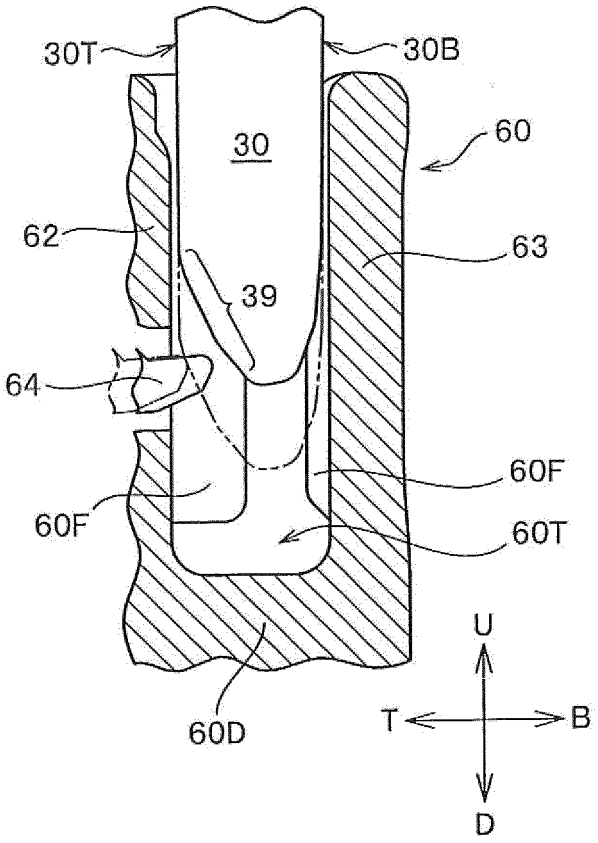


FIG. 8

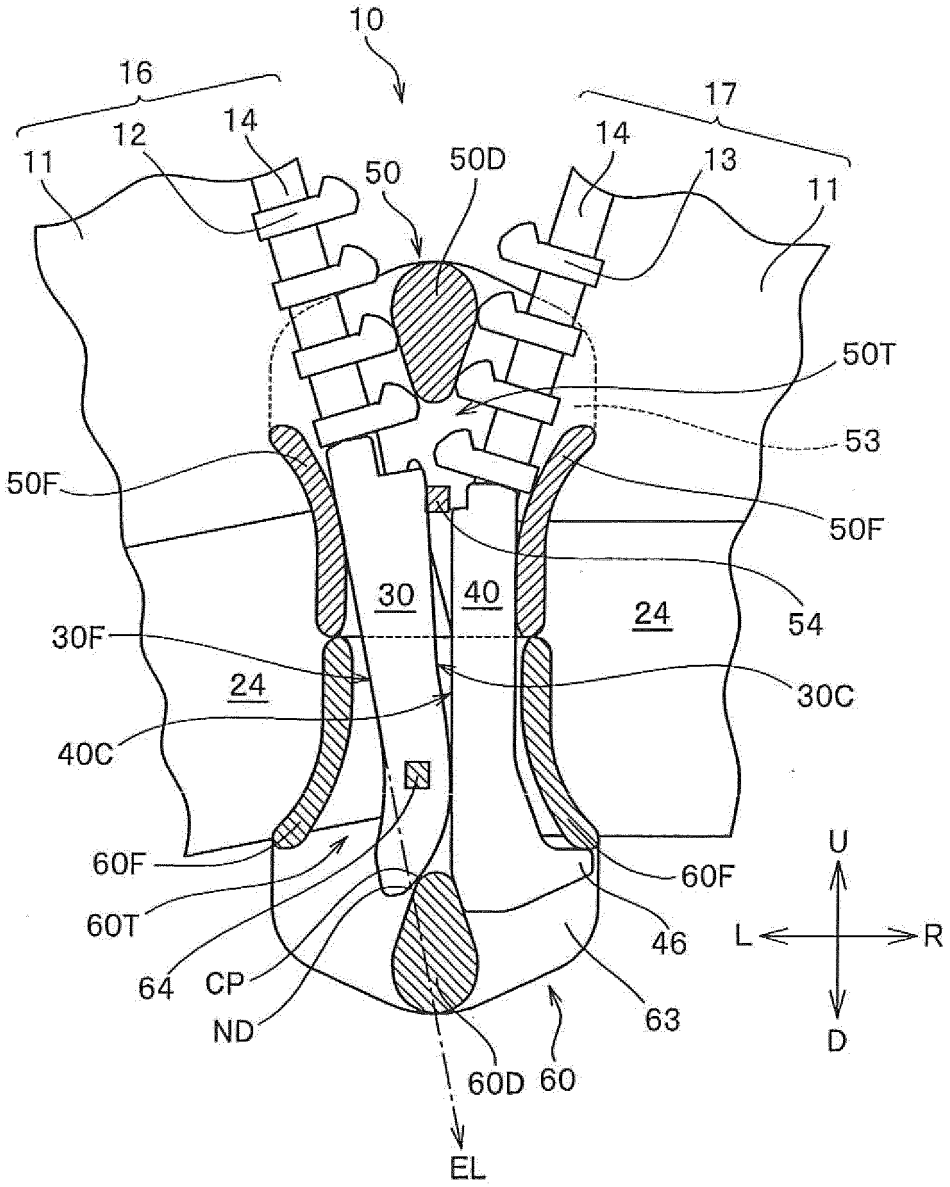

10
16
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12
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50
50D
50T
53
50F
50F
30
40
24
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30F
24
30C
40C
60F
60F
60T
46
64
CP
63
ND
60D
60
EL
U
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R
D

FIG. 9

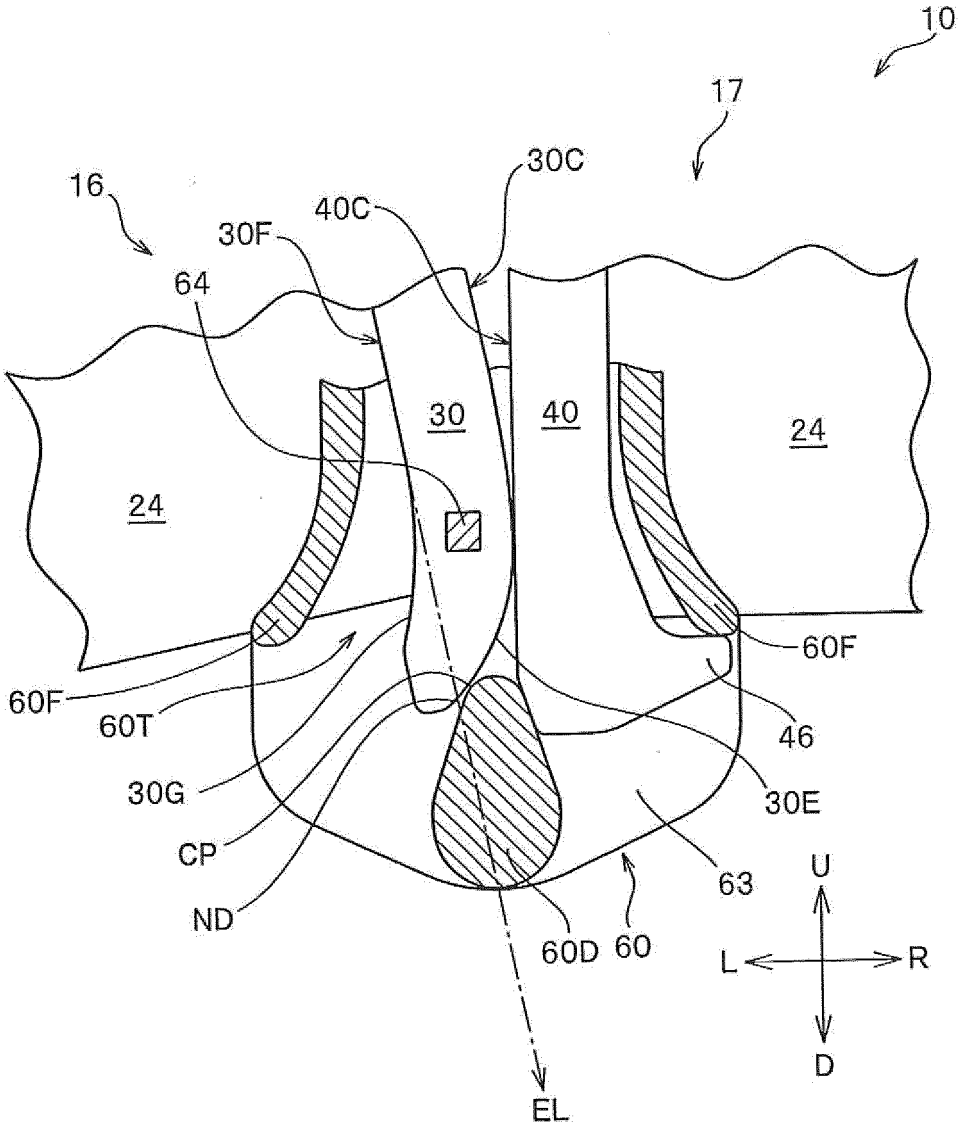

10
17
16
30C
40C
30F
64
30
40
24
24
60F
60T
30G
CP
ND
60F
46
30E
63
60D
60
EL
U
L
R
D

FIG. 10

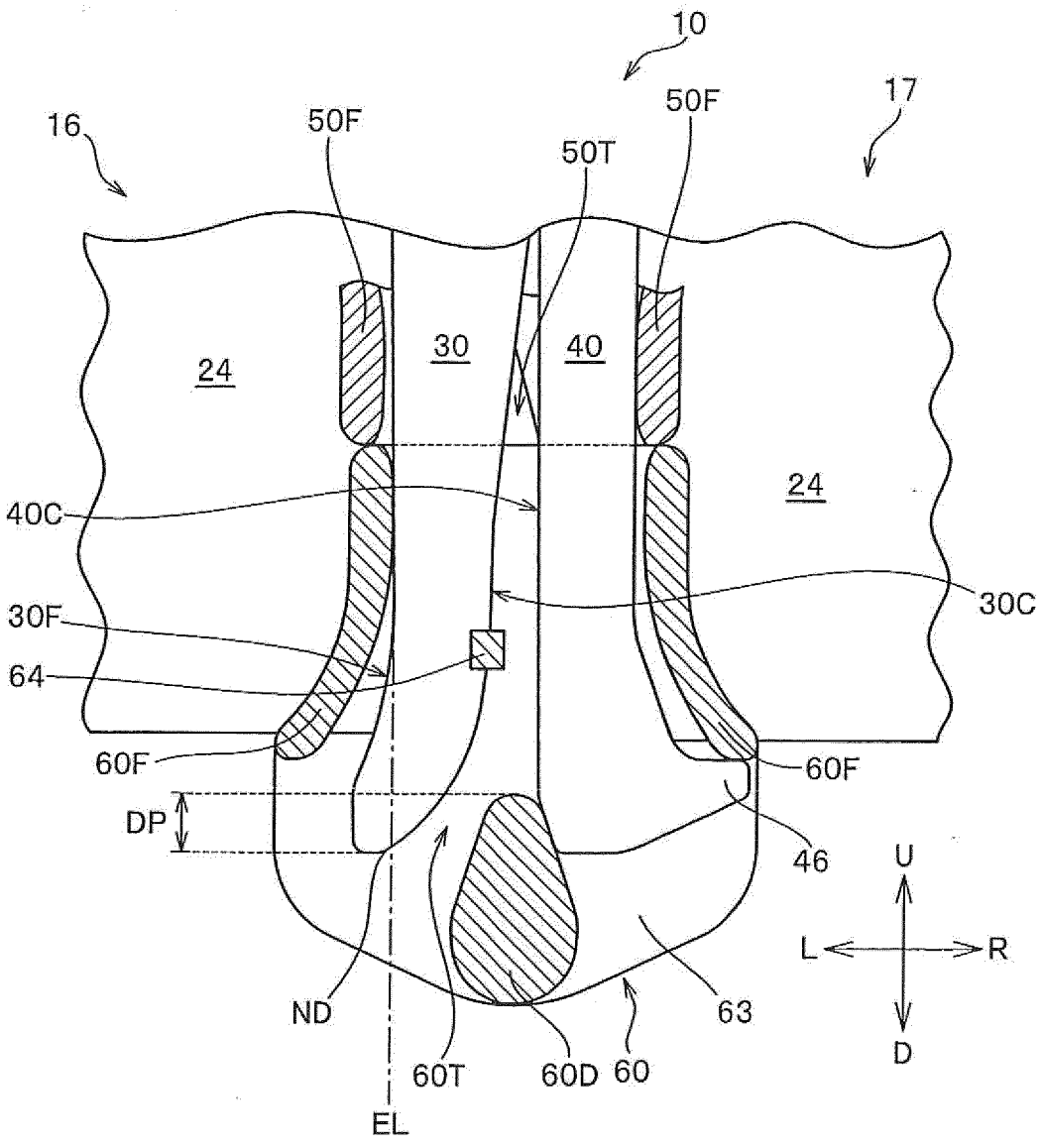

10
16
17
50F
50T
50F
24
30
40
24
40C
30C
30F
64
60F
60F
DP
46
U
L
R
D
ND
63
60T
60D
60
EL

FIG. 11

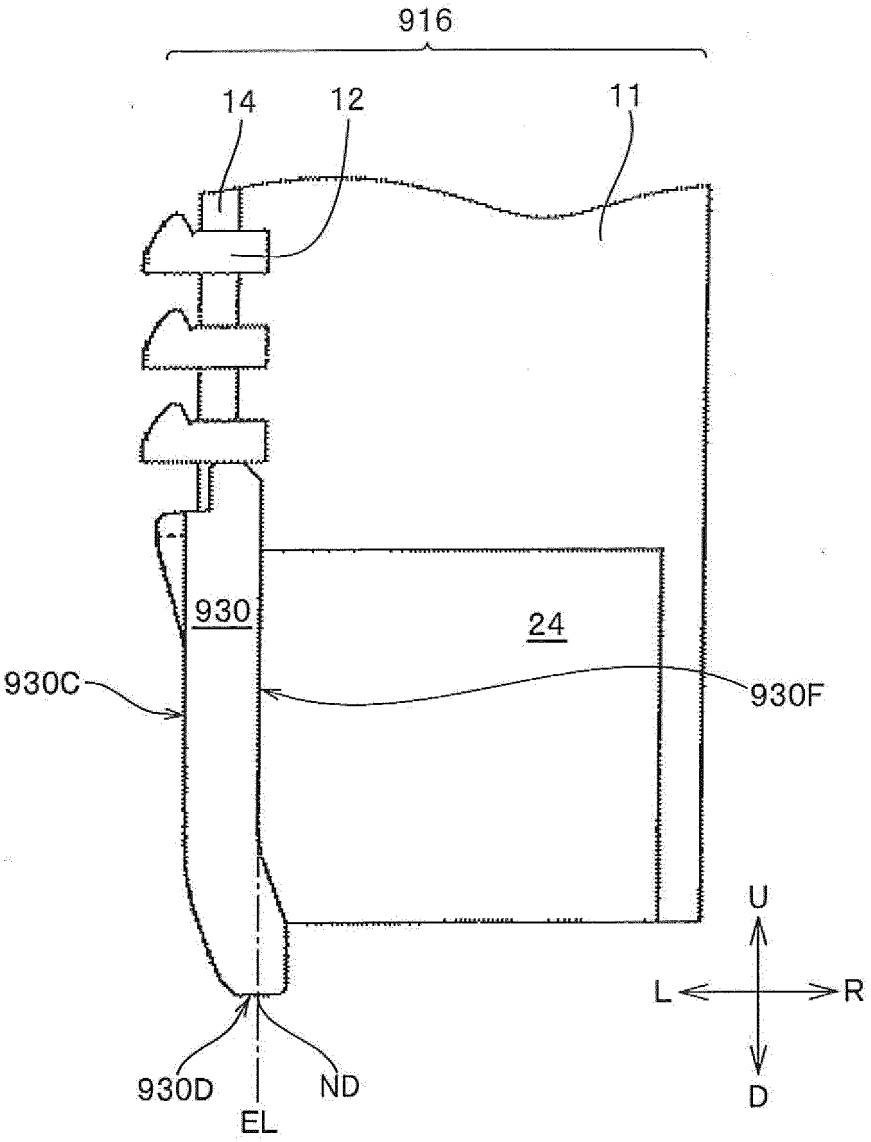
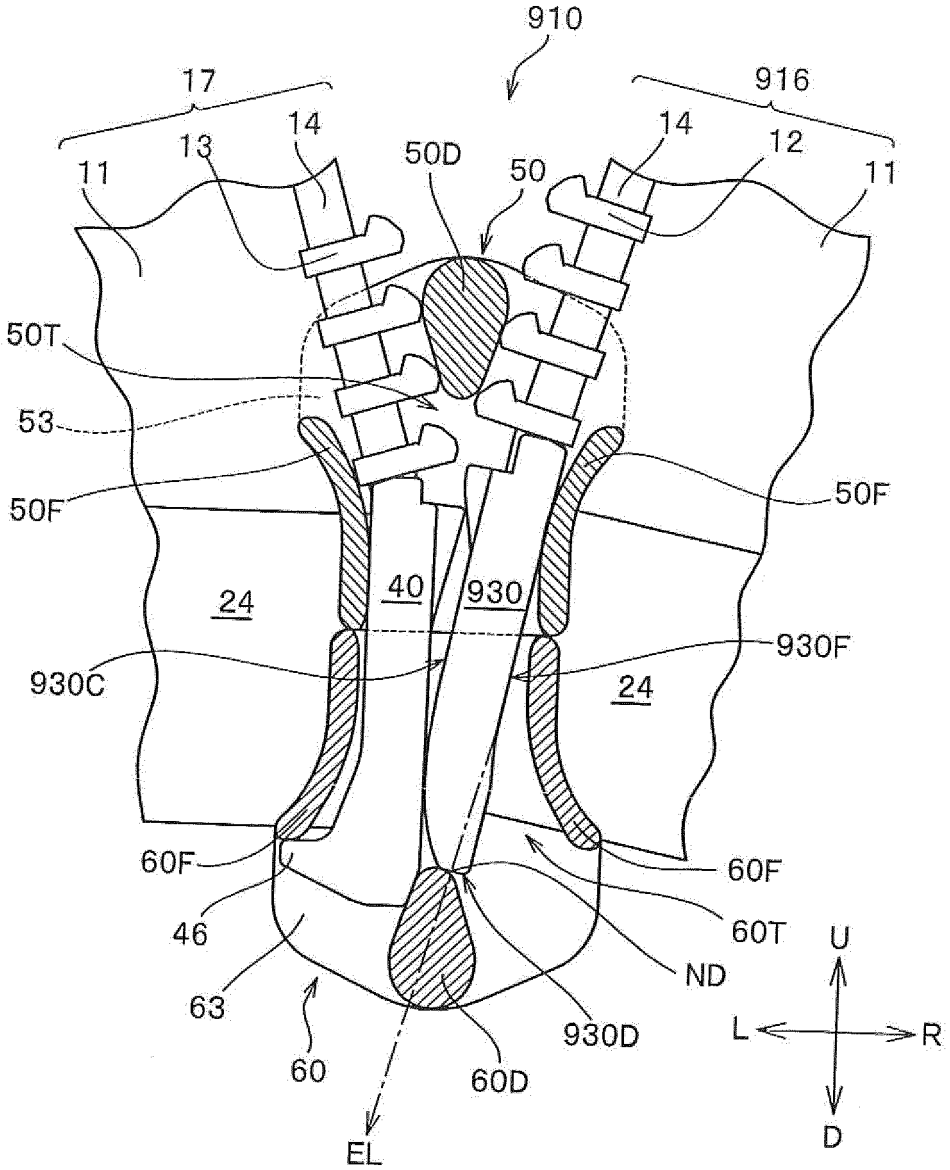


FIG. 12


910
17
916
14
13
14
12
11
50D
50
11
50T
53
50F
50F
24
40
930
930F
930C
24
60F
60F
46
60T
ND
63
930D
60
60D
EL
U
L
R
D

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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