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(54) **SLIDE FASTENER**

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(57) **ABSTRACT**

A slide fastener with a pull rotated type slider, which allows starting operation of the slider to be executed smoothly and easily. A U-shaped guide lever, which allows the pull to move around, is disposed on a periphery of a body of the slider. A guide face for an upper stopper of a pull guide portion with T-shaped section provided on the U-shaped guide lever is formed in an arc face or an inclined face. Consequently, even if the U-shaped guide lever and the upper stopper contact each other, the upper stopper can be guided smoothly by the guide face, thereby the slider being started easily.

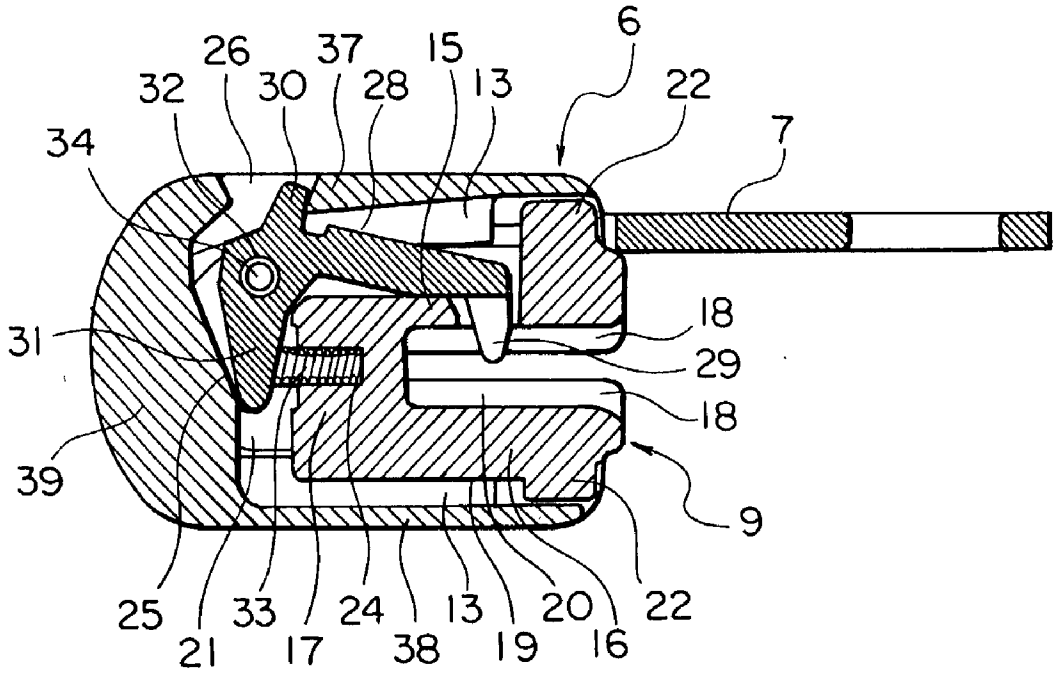

FIG. 1

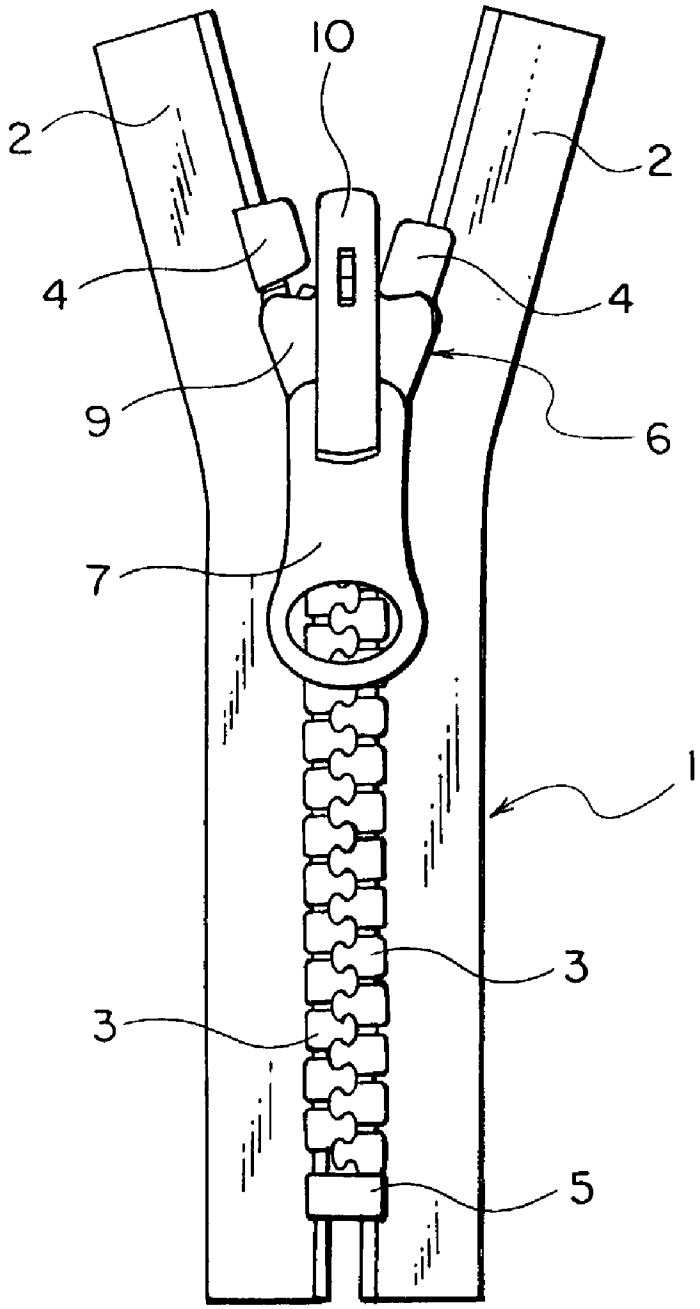

FIG. 2

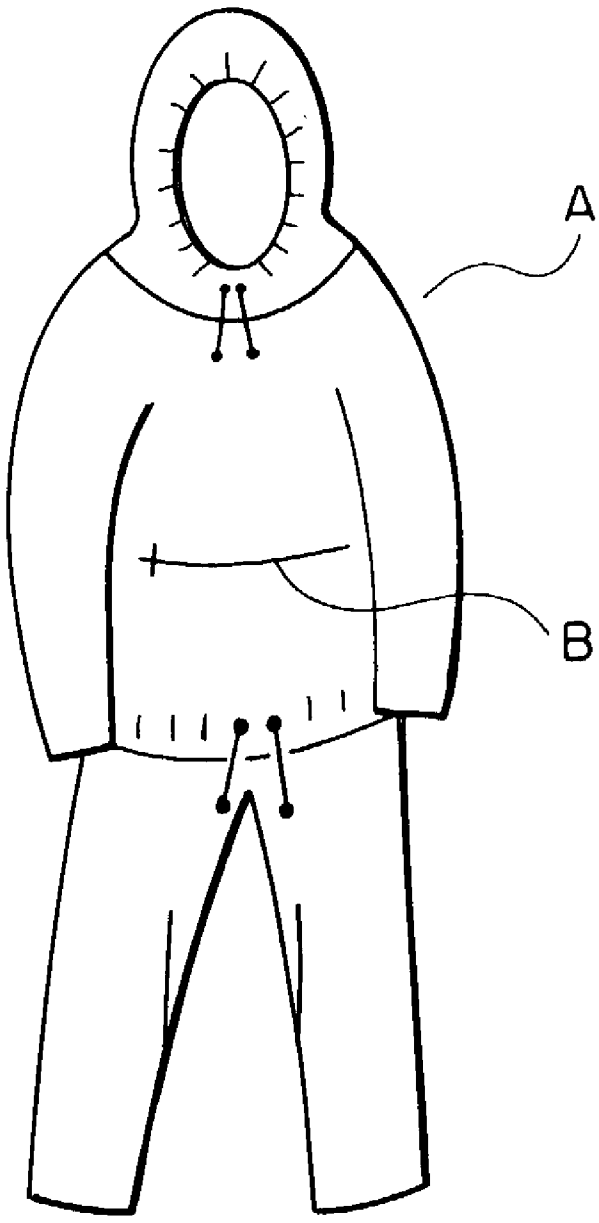

FIG. 3

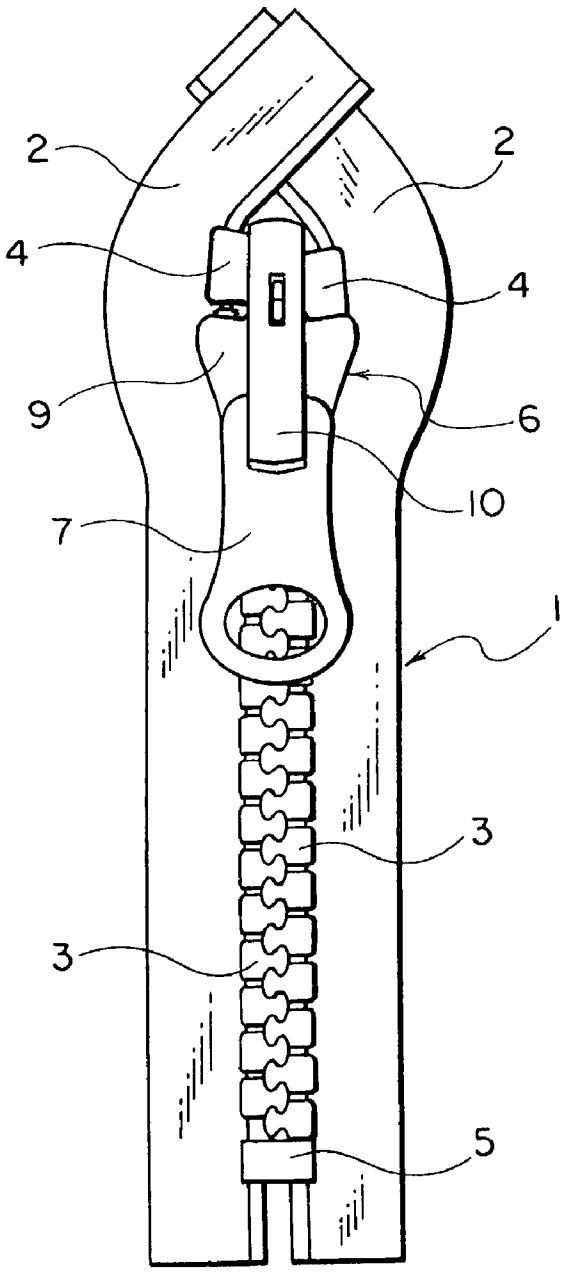

FIG. 4

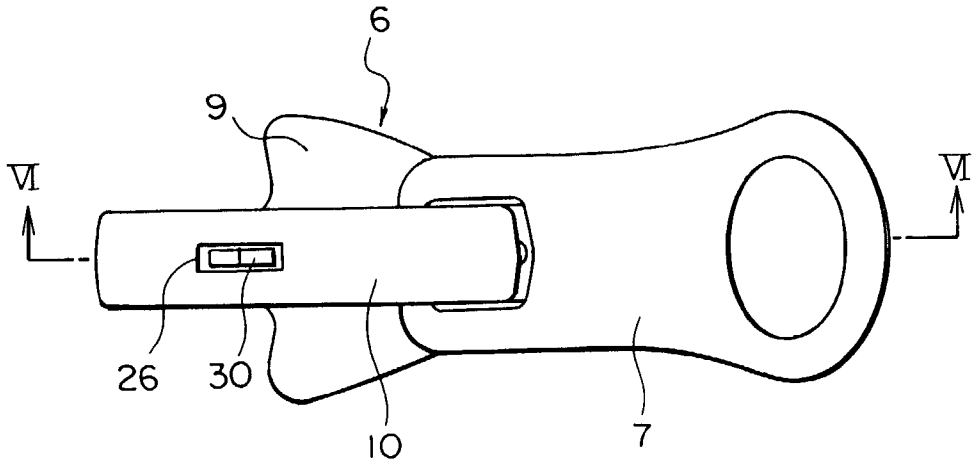

FIG. 5

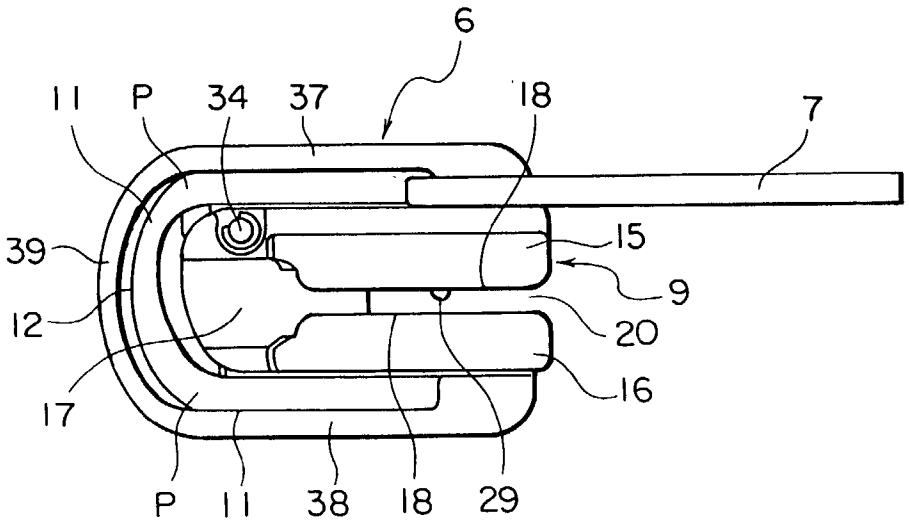

FIG. 6

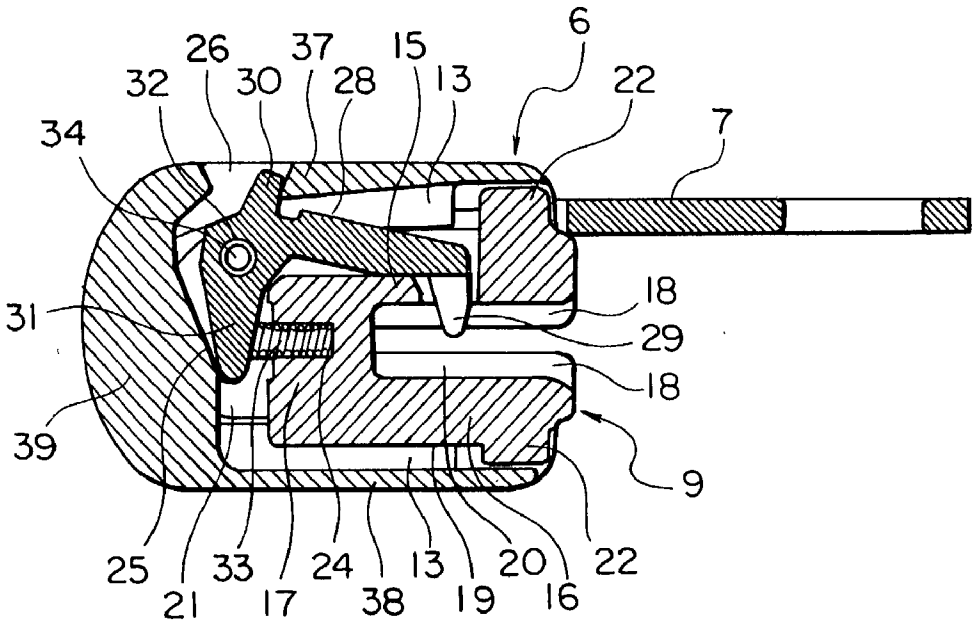
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FIG. 7

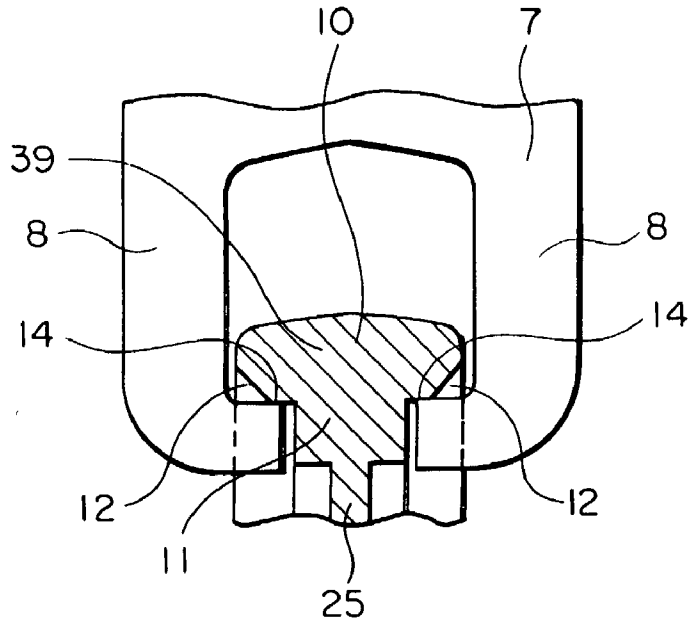
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FIG. 8

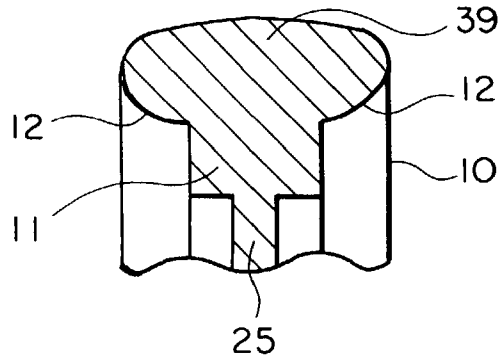

FIG. 9

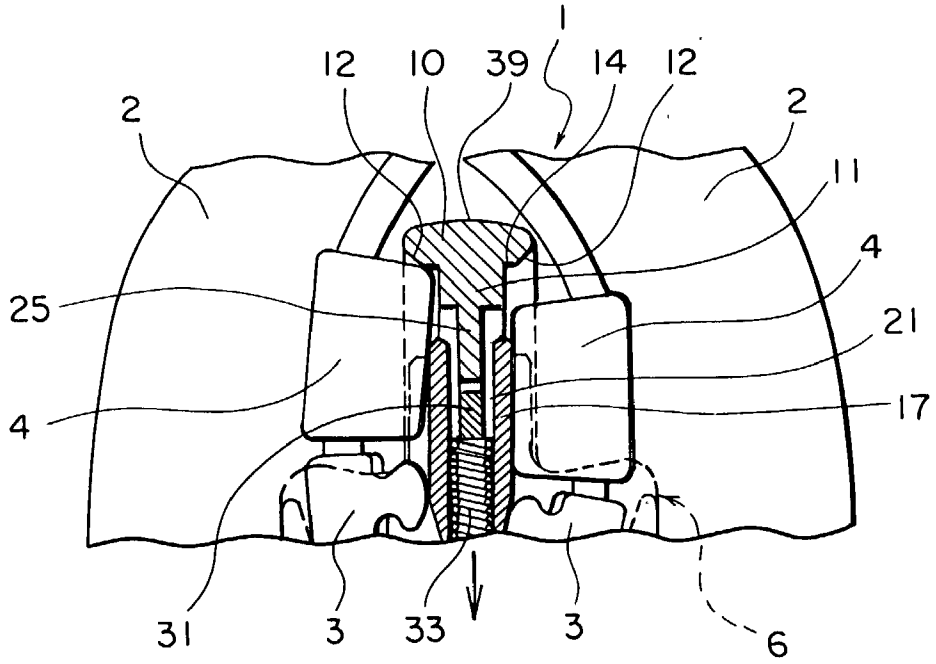

FIG. 10

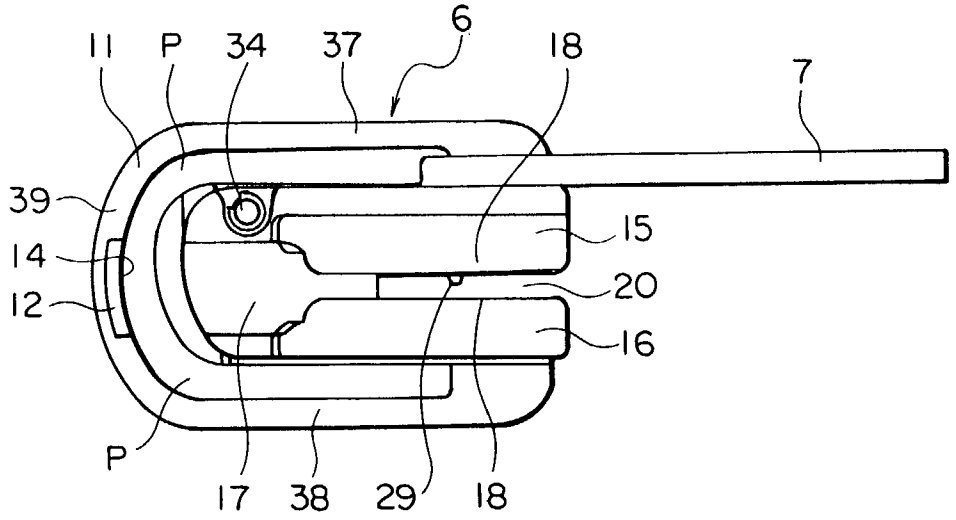
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FIG. 11

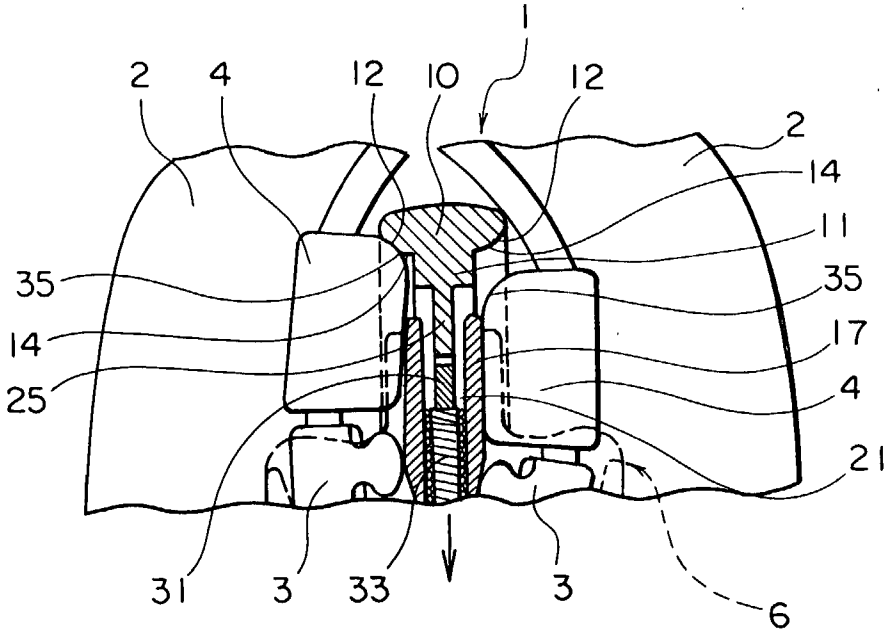
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FIG. 12

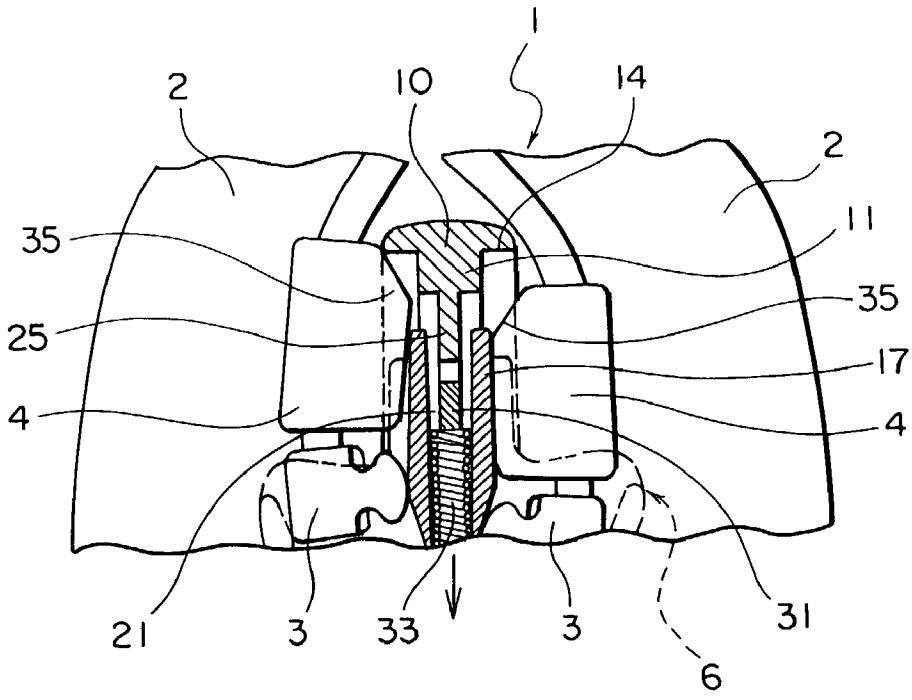
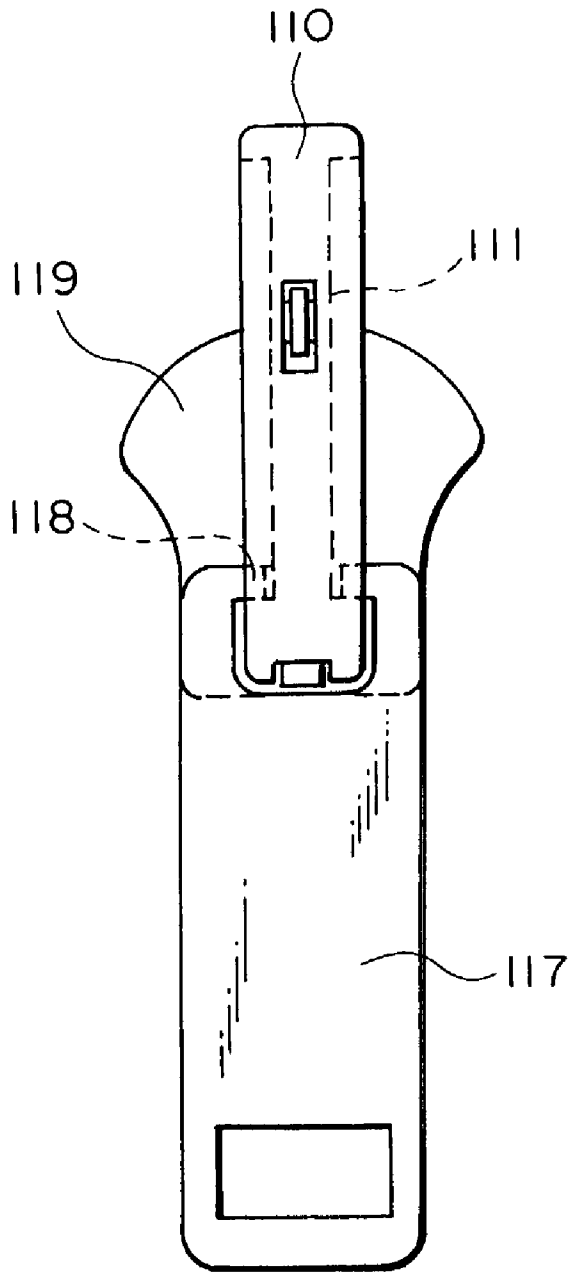


FIG. 13
PRIOR ART



SLIDE FASTENER

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] The present invention relates to a pull rotated type slider of a slide fastener, in which a pull of the slider is capable of rotating from a top face to a front face and a bottom face of a body, and an upper stopper provided on a fastener chain opposing this pull rotated type slider.

[0003] 2. Description of the Related Art

[0004] In a conventionally known pull rotated type slider in a slide fastener, its U-shaped guide lever, which is provided on a body so as to guide a pull for rotating from a top face to a front face and a bottom face of the body, is formed having a T-shaped cross section. Further, the T-shaped guide portion for guiding the pull is so constructed that an inner face at its corner presents a right angle. For example, according to a pull rotated type slider disclosed in Japanese Utility Model Application Publication No. 38-7934, as shown in **FIG. 13**, the inner face at the corner of the U-shaped guide lever **110** provided on the body **119** is formed at the right angle and inwardly directed attachment pieces **118** provided on both sides of a front end of the pull **117** are fitted therein.

[0005] Upper stopper provided on the fastener chain, which the pull rotated type slider formed in the aforementioned way is mounted to slidably, is not an upper stopper having any special configuration, but an rectangular upper stopper made of an ordinarily used thermoplastic resin or a metallic upper stopper having a U-shaped cross section. Thus, this is not an upper stopper particularly corresponding to the U-shaped guide lever of the pull rotated type slider.

[0006] The slide fastener of the invention is attached to an edge of a mouth portion of a front pocket in a wear such as anorak, as shown in **FIG. 2**, so as to be used reversibly, and this slide fastener is convenient when it is intended to accommodate the wear into a reversed pocket. Therefore, if the slide fastener is attached to the edge of the mouth portion of the pocket and used reversibly, fastener tapes on front ends relative to the upper stoppers are mounted more or less in a closed state as shown in **FIG. 3**, for example, so as to form a good appearance pocket.

[0007] If the slide fastener is opened or closed with this state in case of the aforementioned conventional pull rotated type slider and upper stoppers, when the pull rotated type slider is operated to open the fastener chain from its closed condition to its open condition, the upper stopper of the fastener chain comes into contact with an inner face of the guide portion **111** having a T-shaped section in the U-shaped guide lever **110** of the pull rotated type slider, thereby making it difficult for the slider to be started or operated for the opening smoothly.

[0008] The invention has been achieved in views of the above-described problems and a main object of the invention is to provide a slide fastener, in which the pull rotated type slider and/or the upper stopper includes a guide portion for guiding the upper stopper and the guide lever in the pull rotated type slider, which are kept in a contact state with each other when the slider fastener is closed, in the direction that they leave each other in a sliding contact condition, when the pull rotated type slider is operated so as to open the fastener chain, thereby ensuring a start of a smooth opening operation.

[0009] In addition to the object, another object of the invention is to provide a slide fastener, in which even if both fastener tapes on front ends relative to the upper stoppers mounted on the fastener chain are disposed in a closed state, that is, such that they approach each other, excessive contact between the guide lever and the upper stoppers is released easily, thereby starting the opening operation of the pull rotated type slider smoothly. Further, it is a further object to provide a slide fastener, in which a smooth opening operation of the pull rotated type slider is achieved and which comprises a pull rotated type slider which allows the pull thereof to be rotated securely without the pull's escaping from the guide lever through the guide portion.

SUMMARY OF THE INVENTION

[0010] To achieve the above-described objects, according to the invention, there is provided a slide fastener comprising a pull rotated type slider capable of opening or closing a fastener chain in the slide fastener and having a guide lever protruded continuously from a top face, a front face and a bottom face of a slider body thereof, wherein the pull rotated type slider and/or the upper stopper includes a guide face for guiding the guide lever and the upper stopper kept in a state that they contact with each other when the fastener chain is closed to achieve a sliding contact and separation between the guide lever and the upper stopper when the fastener chain is opened.

[0011] With such a structure, it is possible to obtain a slide fastener, in which the pull rotated type slider can be started very smoothly when it is intended to open the fastener chain in the closed state and further execute the opening operation easily.

[0012] And it is preferable that fastener tapes on a front end side relative to the upper stoppers attached of the fastener chain are disposed such that they are curved inwardly, that is, in a closed state. With such a structure, even if front ends of the fastener chain are disposed relatively in the closed state, the pull rotated type slider can be started smoothly and the opening operation can be executed smoothly, thereby finishing a slider fastener optimal for a reversible product.

[0013] Further, in the pull rotated type slider disposed on the fastener chain, it is preferable that a pull guide portion with T-shaped cross section is formed integrally continuous along the guide lever and an inner edge of the pull guide portion mounted on the fastener chain includes a guide face for the upper stopper formed in an arc face or an inclined face. Alternately, it is possible that the upper stopper mounted on the fastener chain includes a guide face for the guide lever formed in the arc face or the inclined face on a corner of an outside edge of the upper stopper which comes into contact with the guide lever of the pull rotated type slider. With employing such a structure, the pull rotated type slider provided on the fastener chain can be started very smoothly.

[0014] And further, it is preferable that the guide face for the upper stopper disposed on the pull guide portion in the guide lever of the pull rotated type slider is provided on an

inner edge of the pull guide portion of a front face of the body or provided on an inner edge of the pull guide portion, which the upper stopper comes into sliding contact with, disposed on the front face of the body. With such a structure, the pull rotated type slider capable of corresponding to the configuration of the upper stopper promptly can be provided easily.

[0015] Further, it is possible that the guide face for the upper stopper disposed on the pull guide portion in the guide lever of the pull rotated type slider has a horizontal holding face capable of coming into sliding contact with an attaching piece at a base end thereof. With such a structure, in the pull rotated type slider inserted into the fastener chain, the pull can be held to the guide lever so securely that it never escapes, and at the same time, the pull can be moved around easily.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] **FIG. 1** is a front view of a slide fastener.

[0017] **FIG. 2** is a front view of a wear employing the slide fastener.

[0018] **FIG. 3** is a front view showing a use condition of the slide fastener.

[0019] **FIG. 4** is a front view of a pull rotated type slider.

[0020] **FIG. 5** is a side view of the same pull rotated type slider.

[0021] **FIG. 6** is a sectional view taken along the line VI-VI in **FIG. 4** of the same pull rotated type slider.

[0022] **FIG. 7** is a sectional view of a front piece of a guide lever.

[0023] **FIG. 8** is a sectional view showing a modification of a front piece of the guide lever.

[0024] **FIG. 9** is a partially broken front view showing a start mechanism disposed in the guide lever.

[0025] **FIG. 10** is a side view showing a modification of the pull rotated type slider.

[0026] **FIG. 11** is a partially broken front view showing the start mechanism disposed in the guide lever and the upper stopper.

[0027] **FIG. 12** is a partially broken front view showing the start mechanism disposed on the upper stopper.

[0028] **FIG. 13** is a front view of a well-known pull rotated type slider.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0029] Hereinafter, embodiments of a slide fastener of the invention will be described with reference to the accompanying drawings.

[0030] The slide fastener of the invention is a reversible slide fastener, which is used at a pocket B in a wear A such as anorak shown in **FIG. 2**. This slide fastener is a well-known slide fastener. For example, in a fastener chain **1** shown in **FIG. 1**, fastener elements **3**, upper stoppers **4** and a lower stopper **5** are integrally molded along side edges of a fastener tape **2** using thermoplastic resin such as polyacetal, polyamide, polypropylene, polybutylene terephthalate or the like, by injection molding means so as to produce a slide fastener. Meanwhile, the fastener element may be zigzag-type linear fastener element of synthetic resin monofilament or a single metallic unit.

[0031] In a known reversible pull rotated type slider **6**, as shown in FIGS. **4** to **6**, in order to form a pull **7** such that it may round from a top face to a front face and a bottom face of a body **9**, in which an upper plate **15** and a lower plate **16** are connected through a diamond **17**, a U-shaped guide lever **10** entirely presenting a U-letter is mounted on the body **9**. The U-shaped guide lever **10** is mounted so as to surround amounting post **22** erected at a rear mouth of the upper plate **15** and the lower plate **16** of the body **9** in a condition that the U-shaped guide lever **10** is capable of moving slightly back and forth. Consequently, the U-shaped guide lever **10** is moved by pulling the pull **7** in a back-and-forth direction.

[0032] A concave portion **21** is provided in a front face of the diamond **17** of the body **9** so as to accommodate a hook piece **31** of a locking lever **28**. Further, an insertion hole **24** is provided laterally in a middle of the diamond **17** and a spring **33** is fitted therein in order to press the hook piece **31** of the locking lever **28**. A pawl hole **23** is made near the rear mouth of the upper plate **15** of the body **9** and a locking pawl **29** of the locking lever **28** is fitted therein. The locking pawl **29** is capable of moving into/from a guide groove **20** in the fastener element **3**.

[0033] In the pull rotated type slider **6**, the body **9** and U-shaped guide lever **10** are formed separately by die-casting using metal such as aluminum alloy, zinc alloy or the like, and the pull **7** is produced by pressing a metallic plate. After that, the pull rotated type slider **6** is assembled.

[0034] An inner face of the U-shaped guide lever **10** is formed with T-shaped cross section. For example, in a front piece **39** of the U-shaped guide lever **10** disposed on a front face of the body **9** as shown in **FIG. 7, a** center of the T-shaped pull guide portion **11** is protruded inward so as to form a cam **25** and a concave groove **13** is provided in a center of each of the pull guide portions **11** of an upper piece **37** and a lower piece **38**. The top portion of the locking lever **28** supported by the body **9** is fitted into the concave groove **13** of the upper piece **37** while a convex row **19** protruded on a surface of the lower plate **16** of the body **9** is fitted into the concave groove **13** of the lower piece **38**.

[0035] The locking lever **28** is entirely formed in substantially elongated inverted-U shape and provided with the locking pawl **29** at one end and the hook piece **31** which is longer than the locking pawl **29** at the other end thereof. A pin hole **32** is provided in a base portion of the hook piece **31** so as to support the locking lever **28** on the body **9** with a pin **34** such that it can swing freely. A protruded piece **30** is provided protrudedly on an upper side of the hook piece **31** and this protruded piece **30** is fitted into an elongated hole **26** provided in the U-shaped guide lever **10** thereby restricting the swing of the locking lever **28** in the back-and-forth direction. When the U-shaped guide lever **10** is moved forward by the pull **7**, the protruded piece **30** is pressed by an edge portion of the elongated hole **26**. Consequently, the locking pawl **29** is made to float from the guide groove **20** against elastic force of the spring **33**, so that the pull rotated type slider **6** can be slid in the closing direction.

[0036] If the pull rotated type slider **6** is slid in the opening direction, the U-shaped guide lever **10** is moved toward the rear mouth by pulling the pull **7**, and at the same time, the hook piece **31** presses and pressurizes the spring **33** by a cam **25** so as to make the locking pawl **29** float from the guide groove **20**. Consequently, the pull rotated type slider **6** can be slid. Generally, the pull rotated type slider is operated as described above.

[0037] The feature of the slide fastener of the invention is provision of a start mechanism, which allows the pull rotated type slider **6** to start smoothly in the opening direction of the fastener chain **1** when the slide fastener is used in a mode that ends of the fastener tape **2** are closed as shown in **FIG. 3**. In case where the conventional slide fastener is disposed in the state shown in **FIG. 3, a** front end of the upper stopper **4** mounted on the fastener chain **1** comes into contact with a corner of the pull guide portion **11** in the U-shaped guide lever **10** disposed in the pull rotated type slider **6**. Consequently, the sliding of the pull rotated type slider **6** is blocked and the starting of the slider becomes difficult.

[0038] According to a first embodiment of the start mechanism in the pull rotated type slider **6** of the invention, as shown in **FIG. 5**, an inclined face at an inner edge portion of the pull guide portion **11** in the front piece **39**, except for the upper piece **37** and the lower piece **38**, in the U-shaped guide lever **10** provided on the periphery of the body **9** is cut out as shown in **FIGS. 7 and 9** so as to form the guide face **12** for the upper stopper.

[0039] The pull guide portion **11** of the U-shaped guide lever **10** is formed with T-shaped cross section and the inner edge portion of this pull guide portion **11** is formed into an inclined face so as to provide the guide face **12**. A holding face **14** for holding the pull **7** in the horizontal condition, which comes into sliding contact with a front end of each L-shaped attaching piece **8** formed in the pull **7**, is formed at a base end of the guide face **12**, thereby holding the pull **7** securely and preventing the pull **7** from escaping from the U-shaped guide lever **10** in advance. In the meantime, the guide face **12**, which is an inclined face in **FIG. 7**, may be an arc face as shown in **FIG. 8**. This arch-shaped guide face **12** is formed such that it is expanded gradually from an end portion of the upper piece **37** or lower piece **38** toward the front piece **39**.

[0040] By disposing such a guide face **12** in the pull guide portion **11**, even if the upper stoppers **4** mounted on the fastener chain **1** has a conventional shape, the upper stoppers **4** are guided and expanded easily to right and left by the guide face **12** provided in the pull guide portion **11** when a force is applied to the pull guide portion **11** in the direction of an arrow as shown in **FIG. 9**. Consequently, the pull rotated type slider can be started smoothly. Meanwhile, a fulcrum of pulling operation of the pull **7** in the closing direction of the pull rotated type slider **6** is a point P indicated in figures.

[0041] According to a second embodiment of the start mechanism, even if the guide face **12** is formed by cutting out a part of the front piece **39** of the U-shaped guide lever **10** provided on the periphery of the body **9**, for example, only a portion which the upper stopper **4** mounted on the fastener chain **1** comes into sliding contact with, so as to define an inclined face or an arc face, as shown in **FIG. 10**, the pull rotated type slider **6** can be started smoothly.

[0042] According to a third embodiment of the start mechanism, as shown in **FIG. 11**, the guide face **12** for the upper stopper **4** is formed by cutting out an inner edge portion of the pull guide portion **11** in the front piece **39** of the U-shaped guide lever **10**, as shown in **FIG. 11**, so as to define an inclined face or an arc face. Further, a guide portion **35** for the U-shaped guide lever **10** is formed by cutting out the corner which the pull guide portion **11** of the U-shaped guide lever **10** in the pull rotated type slider **6** comes into contact with, in the upper stopper **4** mounted on the fastener chain **1**. Consequently, the pull rotated type slider **6** can be started smoothly by a sliding contact between this guide face **12** and the guide portion **35**.

[0043] According to a fourth embodiment of the start mechanism, as shown in **FIG. 12**, the upper piece **37**, the lower piece **38** and the front piece **39** of the U-shaped guide lever **10** in the pull rotated type slider **6** are formed in a conventional configuration with a inner face formed at right angle. The corner which the pull guide portion **11** of the U-shaped guide lever **10** comes into contact with, of the upper stopper **4** mounted on the fastener chain **1** is cut out in a wide inclined face or an arc face protruded outward from the outside edge of the pull guide portion **11** so as to form the guide portion **35** for the U-shaped guide lever **10**. Consequently, the pull rotated type slider **6** can be started smoothly.

[0044] As described above, the slide fastener of the invention has various kinds of the start mechanisms. Therefore, of course, the conventional use condition is available and even if end portions of the fastener chain **1** are closed upon usage as shown in **FIG. 3**, the pull rotated type slider **6** can be started smoothly and further, it can be changed to a reversible slide fastener easily.

What is claimed is:

1. A slide fastener with a pull rotated type slider for opening or closing a fastener chain and having a guide lever protruded continuously from a top face, a front face and a bottom face of a body thereof, wherein at least one of the pull rotated type slider and an upper stopper includes a guide face for guiding the upper stopper and the guide lever kept in a state that they contact with each other upon closing the fastener chain so as to achieve a sliding contact and a separation of the upper stopper and the guide lever upon separating the fastener chain.

2. A slide fastener according to claim 1, wherein right and left end portions of the fastener chain on the side to which the upper stopper is attached are disposed in such a manner that the end portions are approached to each other.

3. A slide fastener according to claim 1, wherein the pull rotated type slider has a pull guide portion with T-shaped cross section continuous along the guide lever and the pull guide portion has a guide face for the upper stopper formed in an arc face or an inclined face on an inner edge thereof.

4. A slide fastener according to claim 1, wherein the upper stopper includes the guide face for the guide lever formed in the arc face or inclined face on a corner of an outside edge thereof which comes into contact with the guide lever.

5. A slide fastener according to claim 3, wherein said guide face for the upper stopper is formed on an inner edge of the pull guide portion disposed on a front face of a body.

6. A slide fastener according to claim 3, wherein said guide face for the upper stopper is formed on an inner edge of the pull guide portion, which the upper stopper comes into sliding contact with, disposed on a front face of a body.

7. A slide fastener according to claim 3, wherein said guide face for the upper stopper has a horizontal holding face at a base end thereof, which comes into sliding contact with an attaching piece of a pull.

* * * * *