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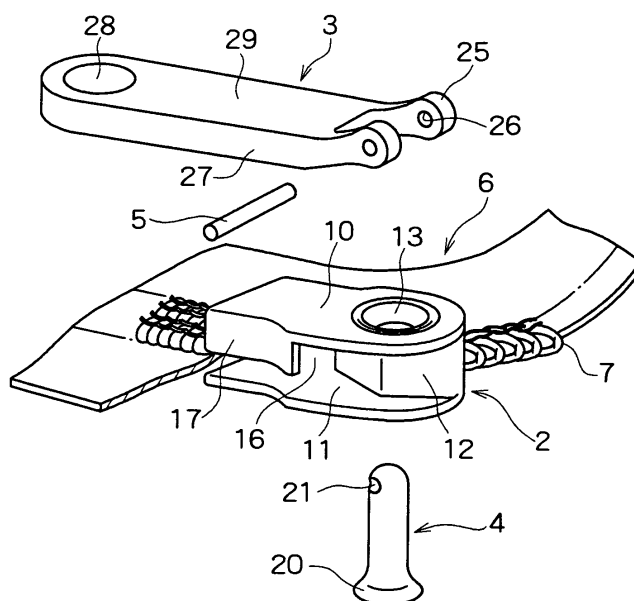
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(54) **Slider for slide fastener**

(57) A slider (1) for a slide fastener comprises a slider body (2) having a mounting hole (13) formed there-through; an attaching pole (4) having a pin hole (21) formed at the upper end to extend laterally therethrough. The attaching pole (4) is upwardly inserted through the mounting hole (13) with its pin hole (21) lying beyond the upper surface of the slider body (2). A pull tab (3) has two attachment lugs (25) formed at its proximal end

and provided with their respective pin apertures (26). A pin (5) is inserted into the pin hole (21) of the attaching pole (4) and the pin apertures (25) of the pull tab (3), so that the pull tab (3) is pivotally mounted on the attaching pole (4). The slider (1) may have a shock-absorbing member (50) made of soft materials and mounted on the pull tab (3) at the region where the pull tab (3) contacts the slider body (2) in order to prevent the pull tab (3) from causing rattling noises.

FIG. 1



Description

[0001] This invention relates to a slider for a slide fastener, and particularly to a slider for a slide fastener wherein a pull tab can be pivotally and rotatably moved on the upper wing of its slider body and the pull tab can be replaced at ease, and which is provided with a simple mechanism to prevent or decrease rattling noises caused by the pull tab striking on the slider body when one jogs in a sport wear bearing the slider.

[0002] Heretofore, there have been sliders of the pull-tab-rotatable type wherein the pull tab can be pivotally and rotatably moved on an upper wing of a slider body. One example is shown in Japanese Utility Model Publication No. 7-46168 and also reproduced in Figure 18 of the drawings appended hereto for convenience sake. The slider body 100 of this slider has a mounting hole 108 formed vertically through the diamond or guidepost 106. The mounting hole 108 terminates at its lower end in a flared recess (not shown) formed in the lower wing 104 of the slider body 100 and terminates at its upper end in a stepped countersink 110, which includes a large-diametered upper bore 110a and a small-diametered lower bore 110b. The large-diametered upper bore 110a is adapted to receive part of a circular disk 116 and the small-diametered lower bore 110b is adapted to receive part of a retaining member 120. The circular disk 116 has a through hole 117 formed centrally there-through. The retaining member 120 has an enlarged head 122, a circular body 124 and a cylindrical leg 126 stacked concentrically one beneath another so as to extend downwardly in a stepped manner. A pull tab 130 has a proximal end bifurcated to provide a pair of attachment lugs 132, which has respective pintles 134 formed in alignment with each other. The pintles 134 of the pull tab 130 are pivotally attached to the diametrically opposite recesses 118 formed on the opposed sides of the circular disk 116. Then, the circular disk 116 is rotatably mounted on the slider body 100 in the large-diametered upper bore 110a. Then, the cylindrical leg 126 of the retaining member 120 is inserted through the mounting hole 108 and is clinched to the slider body 100 by flattening the end of the cylindrical leg 126 in the flared recess, so that the retaining member 120 clamp the slider body 100 between its circular body 124 and its flattened end of the leg 126 with the circular disk 116 interposed between the slider body 100 and the enlarged head 122 of the retaining member 120. Consequently, the pull tab 130 can be moved pivotally and rotatably relative to the slider body 100.

[0003] The slider shown in Figure 18 is of the type that the pull tab 130 is movable both pivotally and rotatably relative to the slider body 100, indeed. However, in case that the pull tab 130 is broken or the wearer desires to replace the pull tab for any other reasons, he or she cannot replace it. There is a great difficulty to replace the pull tab 130, since the leg 126 of the retaining member 120 has its lower end clinched in the flared recess

formed in the lower wing 104 of the slider body 100. If the wearer wishes to replace the pull tab 130, then, the slider as a whole must be replaced. In order to remove the slider from the slide fastener chain used in an article, first, an upper end stop must be removed and then the slider must be pulled off the slide fastener chain. Thereafter, a new slider must be inserted in to the fastener chain and an upper end stop must be attached thereto. The replacing operation is thus tedious and time-consuming.

[0004] Furthermore, since in this type of sliders, a pull tab can be both pivotally and rotatably moved on the slider body; when one do an exercise, such as jogging in a sport wear bearing the slide fastener, the more the pull tab of the slider jolts and strikes against the slider body, disadvantageously causing rattling noises. Such rattling noises give much offence to the ear of the wearer. Moreover, when one walks with a bag along, the pull tab also strikes on the slider body, causing annoying rattling noises. Some methods of preventing or decreasing such rattling noises were adopted before.

[0005] One of the conventional methods is shown in United States Patent No. 5101538 and is conveniently reproduced in Figure 19. As shown in Figure 19, a cylindrical fixing section 202 is provided on one end of a rectangular coupling 201 which is pivotally mounted on a locking arm 204 of a slider body 206. An annular resilient member 210 is molded to the cylindrical fixing section 202 through injecting molding, thus to provide a pull tab 200. The free end 209 of the annular resilient member 210 is normally biased by the resiliency of the annular resilient member 210 itself against fastener elements 208 or fabric strips of the sport wear to which the slide fastener is attached. This prevents the pull tab 200 from jolting and causing rattling noises.

[0006] Another method is shown in Japanese Patent Laid-open application No. 2001-204514 and is also conveniently reproduced in Figure 20. A cover 300 made of metal or plastics is fit to a pull tab 302 of a slider 304 reciprocally mounted along the slide fastener 306. The cover 300 has a locking member 308 in the form of a circular hole formed on the free end thereof. The sport wear has a locking plate 310 mounted on the fabric piece of its front part. The locking plate 310 has a locking projection 312 formed thereon. When the slide fastener 306 is closed, the locking member 308 of the cover 300 is adapted to come into locking engagement with the locking projection 312 of the locking plate 310, which prevent the pull tab 302 from jolting and hence causing rattling noises.

[0007] The slider 206 of the slide fastener shown in Figure 19 is complex in construction and requires a special pull tab 200. Therefore, the manufacturing cost is very high. It is difficult to supply this slider 206 at a lower price.

[0008] In the slider 304 of the slide fastener shown in Figure 20, in order to prevent rattling noises of the pull tab 302, it is necessary to slide the slider 304 all the way

up to the end of the slide fastener and to bring the locking member 308 of the cover 300 into locking engagement with the locking projection 312 of the locking plate 310, while starting the locking member 308 and the locking projection 312 very attentively, which is very tedious. When the pull tab 302 is not locked to the locking projection 312 of the locking plate 310, or when pull tab 302 stops in the middle of the slide fastener chain 306, the attachment link 307 of the pull tab 302 which remains uncovered tends to strike against the slider body 305, causing rattling noises. So, as mentioned above, it is absolutely necessary to slide the slider 304 all the way up to the end of the slide fastener 306 and to bring the locking member 308 of the cover 300 into locking engagement with the locking projection 312 of the locking plate 310, which is very tedious.

[0009] In view of the drawbacks set forth above, the present invention has as its object to provide a slider for a slide fastener of the type that a pull tab is pivotably and rotatably connected to the slider body, which has a simple mechanism whereby only the pull tab can be replaced at great ease, even when the slider is used in the slide fastener attached to an article; if the pull tab is broken or the wearer wishes to replace the pull tab.

[0010] Another object of the present invention is to provide double sliders for a slide fastener wherein a pair of sliders are reciprocally mounted on a single fastener chain and disposed reversely to each other, the pull tabs of the two sliders can be locked by a locking means reliably and easily.

[0011] Still another object of the present invention is to provide a slider for a slide fastener which has a pull tab pivotably and rotatably connected to the slider body and which has means for preventing or decreasing rattling noises caused by the pull tab striking against the slider body, thus accomplishing muffling effects simply and less costly.

[0012] Yet another object of the present invention is to provide double sliders for slide fasteners wherein a pair of sliders are reciprocally mounted on a single fastener chain and disposed reversely to each other, the pull tabs of the two sliders can be locked by a locking means reliably and easily and each slider has means for preventing or decreasing rattling noises caused by the pull tabs striking each other or each pull tab striking against the respective slider body, thus accomplishing muffling effects simply and less costly.

[0013] Further objects and advantages of the invention will become apparent from a consideration of the drawings and ensuing description.

[0014] According to the present invention, there is provided A slider reciprocally mounted on a slide fastener chain, comprising: a slider body including a guide-post having a mounting hole formed therethrough; an attaching pole having a large-diametered portion formed at its one end and having a pin hole formed at the other end so as to extend laterally therethrough; the attaching pole inserted upwardly through the mounting

hole and rotatably mounted on the slider body with the pin hole lying beyond the upper surface of the slider body; a pull tab including a grip portion and two attachment lugs formed by bifurcating the proximal end of the pull tab, the attaching lugs having their respective pin apertures formed in alignment with each other; and a pin inserted into the pin hole of the attaching pole and the pin apertures of the pull tab, so that the pull tab is pivotally mounted on the attaching pole.

[0015] According to another aspect of the invention, an additional slider is reciprocally mounted on the fastener chain, so that the two sliders are disposed reversely to each other on the fastener chain. The pull tab of one slider 1 is bent obtusely at a bent portion which is adjacent to the attachment lugs in reverse direction relative to the pull tab of the other slider and each pull tab has a through hole formed therethrough adjacent to its distal end, so that when both sliders 1 come into abutting engagement to each other to close the slide fastener chain, said one pull tab can be turned over flat against said other pull tab, with their respective through holes in registry with each other.

[0016] According to still another aspect of the invention, the slider body and pull tab are made of hard material. The slider further includes a shock-absorbing member made of soft material and mounted on the pull tab at its region where the pull tab contacts the slider body, so as to bulge on both upper and lower surfaces of the pull tab. This means that the shock-absorbing member is softer than the slider body.

[0017] Many other advantages and features of the present invention will become manifest to those versed in the art upon making reference to the detailed description and accompanying sheets of drawings in which preferred structural embodiments incorporating the principles of the present invention are shown by way of illustrative example.

Figure 1 is an exploded perspective view of a slide fastener slider according to the first embodiment of the present invention, showing a slide fastener chain partly cut-away.

Figure 2 is a perspective view of the slider of Figure 1, showing the parts in assembled disposition.

Figure 3 is a cross-sectional view of the slider of Figure 2.

Figure 4 is a cross-sectional view of the slider of Figure 2, with its pull tab stand upright.

Figure 5 is an enlarged cross-sectional view of the essential part of the slider of figure 2 showing how the pull tab is attached to an attaching pole.

Figure 6 is a cross-sectional view of a slide fastener slider according to the second embodiment of the present invention.

Figure 7 is a cross-sectional view of a slide fastener slider according to the third embodiment of the present invention.

Figure 8 is a cross-sectional view of a slide fastener

slider according to the fourth embodiment of the present invention.

Figure 9 is a cross-sectional view of a slide fastener slider according to the fifth embodiment of the present invention.

Figure 10 is a perspective view showing double sliders arranged reversely to each other according to the sixth embodiment of the present invention.

Figure 11 is a front view showing the double sliders of Figure 10 in use on a slide fastener chain.

Figure 12 is a perspective view of a slide fastener slider according to the seventh embodiment of the present invention.

Figure 13 is a partially sectional view of a slide fastener slider of Figure 12, showing how the pull tab is pivoted.

Figure 14 is a front view of the slider of Figure 12, showing how the pull tab is rotated.

Figure 15 is a front view of the pull tab of the slider of Figure 12.

Figure 16 is a partly cross-sectional side view of the pull tab of the slider of Figure 12.

Figure 17 is a front view of double sliders according to the eighth embodiment of the present invention, showing how the pull tabs of the two sliders are locked.

Figure 18 is an exploded perspective view of a conventional slide fastener slider.

Figure 19 is a perspective view of another conventional slider wherein a pull tab is prevented from being pivoted.

Figure 20 is a front view of still another conventional slide fastener slider wherein a pull tab is also prevented from being pivoted.

[0018] Description is now made on a slider 1 for a slide fastener according to the first embodiment of the present invention shown in Figures 1 through 5 of the drawings appended hereto.

[0019] According to the present invention, broadly, a slider 1 is comprised of four parts, that is, a slider body 2, a pull tab 3, an attaching pole 4 and a pin 5. These parts are all made of metal. The slider body 2 comprises an upper wing 10 and a lower wing 11 joined at their fronts by a guidepost 12. A mounting hole 13 is formed vertically through the guidepost 12 to receive the attaching pole 4 therethrough. An upper and a lower countersink 14 are formed at the upper and lower ends, respectively, of the mounting hole 13. A raised run 15 is formed around the countersink 14 on each of the outer surfaces of the upper and lower wing 10, 11. Consequently, the pull tab 3 attached to the attaching pole 4 contacts the slider body 2 on only the raised rim 15 or a little contacting surface and hence incurs a little frictional resistance, so that the pull tab 3 can be moved pivotally and rotatably relative to the slider body 2 smoothly.

[0020] The pull tab 3 includes a grip portion 29 as a major portion and a pair of opposed attachment lugs 25

formed by bifurcating the proximal end of the pull tab 3 and adapted to be attached to the attaching pole 4. A pair of pin apertures 26 are formed through the respective attaching lugs 25 and disposed in alignment with each other. The pin apertures 26 are slightly greater in diameter than the pin 5 in order to let the pin 5 through. As viewed in the profile, the pull tab 3 is bent obtusely at a bent portion 27 which is adjacent to the attachment lugs 25. As a result, the pull tab 3 attached to the attaching pole 4 can either contact on or stay float above the front surface of the article such as clothing or bags to which the slide fastener is attached, so that the pull tab 3 can be advantageously arranged on the article in stably and sightly, and further the pull tab 3 can be gripped very easily.

[0021] The attaching pole 4 is cylindrical and is provided at its lower end with a large-diametered portion 20 which is adapted to fit into the lower countersink 14. A pin aperture 21 is formed laterally through the attaching pole 4 adjacent its upper end and is adapted to have the pull tab 3 pivotally mounted thereon. The pin hole 21 is narrowed at its middle to provide a narrowed portion 22 in the form of an inner peripheral projection projecting inwardly in order to firmly fasten the pin 15 therein. The pin 5 is cylindrical but has a wave-like slit 31 formed longitudinally throughout its length so as to impart resiliency to the pin 5. Such a pin 5 is commonly called as a spring pin.

[0022] In order to assemble the slider 1, first, the attaching pole 4 is inserted through the mounting hole 13 formed through the guidepost 12 of the slider body 2 from its lower end, until the large-diametered portion 20 of the attaching pole 4 fits into the countersink 14 and the pin hole 21 of the attaching pole 4 comes up beyond the upper surface of the slider body 2. Then, the pin hole 21 of the attaching pole 4 and the pin apertures 26 of the opposed attachment lugs 25 of the pull tab 3 are brought into alignment with each other. With the pin hole 21 and the pin apertures 26 kept in alignment, the pin 5 is forced into the pin aperture 26 of the attachment lugs 25 of the pull tab 3 and then the pin hole 21 of the attaching pole 4 against the resiliency of the pin 5, so that the pin 5 is secured to the narrowed portion 22 of the pin hole 21 by its own resiliency and the assemblage of the slider 1 has been carried out.

[0023] In order to replace the pull tab 3 when the pull tab 3 is broken or the wearer desires to replace it for other reasons, the pin 5 is pulled off the pin apertures 26 of the attachment lugs 25 of the pull tab 3 and the narrowed portion 22 of the pin hole 21 of the attaching pole 4 against resiliency of the pin 5. Then, the pull tab 3 is removed from the slider body 2. Lastly, a new pull tab is attached to the attaching pole 4 in the way mentioned earlier.

[0024] As shown in Figure 1, as mentioned earlier, the slider 1 is comprised of four parts, that is, the slider body 2, the pull tab 3, the attaching pole 4 and the pin 5. The slider body 3, the pull tab 4 and the attaching pole 4 are

made of hard materials. They are die-casted from metals such as zinc alloy, aluminum alloy, or are injection molded from hard plastics such as polyacetal, polyamide, polypropylene, polybutylene terephthalate. The slider body 2 is comprised of an upper and lower wings 10, 11 joined at their front ends by the guidepost 12. A pair of guide flanges 17 are provided one on each side edge of the upper wing 10 to define with the guide post 12 a Y-shaped guide channel 16 to guide fastener elements 7 therethrough. The attaching hole 13 of a circular cross-section is formed vertically through the guidepost 4. The mounting pole 4 is inserted through the attaching hole 13. As shown in Figure 3, the upper and lower countersinks 14 are formed in the upper and lower ends of the attaching hole 13, respectively. As shown in Figure 4, as mentioned above, the raised rims 15 are formed on the outer surfaces of the upper and lower wing 10, 11 around the countersinks 14. The raised rim 15 is adapted to come into sliding contact with the tips of the attachment lugs 25 of the pull tab 3, when the pull tab 3 is pivoted or rotated on the slider body 2.

[0025] As shown in Figure 1, The pull tab 3 includes a grip portion 29 as a major portion and a pair of opposed attachment lugs 25 formed by bifurcating the proximal end of the pull tab 3. The two attaching lugs 24 have the respective pin apertures 26 formed therethrough, which pin apertures 26 are in alignment with each other. The pin apertures 26 are greater in diameter than the pin 5 in order to let the pin 5 through. Furthermore, the pin apertures 26 are formed greater in diameter than the pin hole 21 formed through the attaching pole 4. As view in the profile, the grip portion 29 of the pull tab 3 is bent obtusely at a bent portion 27 adjacent to the attachment lugs 25. A circular through hole 28 is formed through the grip portion 29 adjacent to the distal end.

[0026] As further shown in Figure 1, the attaching pole 4 designed to attach the pull tab 3 thereto is cylindrical as a whole and has a large-diametered portion 20 formed at its lower end so as to spread radially therefrom. The large-diametered portion 20 is adapted to fit to the countersink 14 of the slider body 2. The attaching pole 4 has the pin hole 21 formed through its upper end and designed to pivotally mount the pull tab 3 thereon. The pin hole 21 has a narrowed portion 22 formed at its middle in the shape of an inner projection 22 projecting inward from its inner surface, so as to fasten the inserted pin 5 through its resiliency. The narrowed portion 22 may be in the form of a U-cross-sectioned projection or a convex cross-sectioned projection as shown in Figure 5. The narrowed portion 22 may be of any cross-sectional form as far as it can function to fasten the pin 5 thereto.

[0027] The pin 5 may be of any shape that permits the pin 5 to be inserted into the pin hole 21 and firmly clamped by the narrowed portion 22 thereof. So, the pin 5 may be either solid or hollow like a pipe. The most preferred construction of the pin 5 is a hollow cylinder or pipe which has a wave-like groove formed axially

thereof in order to impart resiliency to the pin 5, so that the pin 5 can be readily inserted through the narrowed portion 22 of the pin hole 21 and thereafter the pin 5 can be firmly clamped in the narrowed portion 22 through resiliency of the pin 5.

[0028] For assemblage of this slider 1, first, the cylindrical attaching pole 4 is inserted upwardly through the circular mounting hole 13 formed through the guidepost 12 of the slider body 2 until the large-diametered portion 20 of the attaching pole 4 fit into the countersink 14, whereupon the attaching pole 4 is rotatably mounted on the slider body 2. Then, the pin apertures 26 formed through the attaching lugs 25 are brought into registry with the pin hole 21 of the attaching pole 4 lying beyond the upper surface of the slider body 2. Then, the pin 5 is forced through the pin apertures 26 and the pin hole 21 so that the pin 5 passes through the narrowed portion 22 of the pin hole 21 by contracting its diameter against its resiliency and then get clamped by the narrowed portion 22 through resiliency of the pin 5. Consequently, the pin 5 itself is fastened to the mounting pole 4, but the pull tab 3 is pivoted back and forth on the pin 5. In addition, since the attaching pole 4 is rotatably mounted on the slider body 2, the pull tab 3 can be rotate horizontally on the slider body 2 in free manner with the tips of the attaching lugs 25 sliding on the raised rim 15.

[0029] As shown in Figure 2, the slider 1 according to the invention is assembled with a slide fastener chain 6 to provide a slide fastener. The thus assembled slide fastener is then sewn to an article, such as clothing or bags. When the pull tab 3 is broken or the wearer wishes to replace the pull tab 3 in the slide fastener incorporated in the article, the wearer can dismantle the pull tab 3 by merely removing the pin 5 from the pin aperture 26 of the pull tab 3 and pin hole 21 of the attaching pole 4. Then, a new pull tab 3 can be attached to the attaching pole 4.

[0030] A slide fastener slider according to the second embodiment of the present invention shown in Figure 6 is designed for use with a slide fastener chain of the type wherein fastener element rows are sewn to the rear surface of its fastener tapes. Unlike the slider 1 according to the first embodiment, this slider 1 has a pair of guide flanges 17 formed on a lower wing 11 of its slider body 2 to guide the fastener elements 7. The mounting hole 13 has the same shape in its upper part and its lower part, as in the case of the first embodiment. As well seen from comparison of Figures 3 and 6, the assemblage of the slider 1 according to the second embodiment is identical with that according to the first embodiment with the only exception that the slider body 2 has been placed upside down. The attaching pole 4 is first inserted upwardly through the mounting hole 13. The pin apertures 26 of the attaching lugs 25 are brought into registry with the pin hole 21 of the attaching pole 4. Then, the pin 5 is forced through the pin apertures 26 and the pin hole 21 so that the pin 5 is releasably attached to the attaching pole 4.

[0031] Figure 7 shows a slide fastener slider 1 according to the third embodiment of the present invention. In this slider 1, the mounting hole 13 is of the shape of a truncated cone with a larger-diametered portion disposed at its bottom. A raised rim 15 is formed around the mounting hole 13 on only the upper surface of the slider body 2. The attaching pole 4 is also of the shape of a truncated cone as a whole. Since the mounting hole 13 is of a truncated cone, and the attaching pole 4 is of a complementarily truncated cone, the attaching pole 4 can be mounted on the slider body 2 in very stable manner so that the attaching pole 4 can be rotated on the slider body 2 very smoothly. The attaching pole 4 has a pin hole 21 formed laterally therethrough at its upper end for housing a pin 5 therethrough. As viewed in profile, the pull tab 3 as a whole (including the attachment lugs 25) is formed straight, unlike the one according to the preceding embodiments. The pin apertures 26 of the attaching lugs 25 are brought into registry with the pin hole 21 of the attaching pole 4 lying beyond the upper surface of the slider body 2. Then, the pin 5 is forced through the pin apertures 26 and the pin hole 21. It is readily seen that, unlike the slider body 2 according to the preceding embodiments, the slider body 2 according to the third embodiment is unidirectional, that is, the slider body 2 can allow the attaching pole 4 to fit into its mounting hole 13 when disposed in only one direction, in other words, the attaching pole 4 cannot fit into the mounting hole 13, if the slider body 2 is disposed upside down.

[0032] Figure 8 shows a slide fastener slider according to the fourth embodiment of this invention. The slider according to the fourth embodiment is substantially identical with the slider according to the first embodiment except that the attaching hole 13 has a countersink 14 formed at its lower end alone.

[0033] Figure 9 shows a slide fastener slider 1 according to the fifth embodiment of this invention. This slider 1 has a simple cylindrical mounting hole 13 with a uniform diameter throughout its length formed through the guidepost 12 of the slider body 2. The attaching pole 4 is substantially of a simple cylindrical shape and has a large-diametered portion 20 in the shape of a thin disk integrally formed at the lower end thereof. The large-diametered portion 20 is flat at its inner and outer surfaces. The large-diametered portion 20 is adapted to intimately contact the lower surface of the slider body 2. Instead of the large-diametered portion 20 integrally formed with the attaching pole 4, the pole body of the attaching pole 4 and the large diametered portion 20 may be formed as separate parts. For example, the lower end of the pole body of the cylindrical attaching pole 4 is provided with an internal thread and the large-diametered portion 20 has a correspondingly threaded shank formed centrally of the upper surface thereof. The threaded shank of the large diametered portion 20 is screwed with the internal thread of the pole body of the cylindrical attaching pole 4, thus provide the attaching pole 4.

[0034] Figures 10 and 11 show double sliders 1 for a slide fastener according to the sixth embodiment of this invention. In this embodiment, the two sliders 1 are reciprocally mounted on a single slide fastener chain 6 and disposed reversely to each other. One of the two sliders 1 according to this embodiment (the left one as viewed in Figure 10) is identical with the slider 1 according to the first embodiment but the right one differs therefrom in that the pull tab 3 is bent at the bent portion 27 reversely to the pull tab 3 of the slider 1 according to the first embodiment. Since one pull tab 3 is bent reversely to the other pull tab 3; when both sliders 3 are brought into abutting engagement with their respective front ends contacted with each other to close the slide fastener chain 6 as shown in Figure 11 and one pull tab 3 is turned over against the other, one pull tab 3 can be laid flatly over the other. As shown in Figure 11, after one pull tab 3 is laid flatly over the other with their respective circular through holes 28 in registry with each other, a shackle 35 of a padlock 34 is inserted through the circular through holes 28 of the pull tabs 3 of both sliders 1 and locked. Both pull tabs 3 being reversely bent at the bent portion 27 permits one pull tab 3 to be laid flatly the other pull tab 3 when the former is turned against the latter. This facilitates the insertion of the locking of the shackle 35 of the padlock 34.

[0035] Figures 12 through 16 shows a slide fastener slider 1 according to the seventh embodiment of the present invention. The slider 1 according to the seventh embodiment is substantially identical with the slider 1 according to the first embodiment except that the pull tab 3 has a shock-absorbing member 50 mounted in its region where the grip portion 20 of the pull tab 3 contacts the slider body 3, when the pull tab 3 is pivoted or rotated on the slider body 2. The shock-absorbing member 50 is made of soft materials, such as polyurethane, silicon rubber, thermoplastic elastomer, and other soft plastics, which are softer than the materials of the slider body 2 and the pull tab 3, so that the shock absorbing member 50 functions to absorb the shock caused by collision of the pull tab 3 and the slider body 2, thus prevent rattling noises from getting caused.

[0036] In order to mount the shock-absorbing member 50 on the pull tab 3; as shown in Figure 15, first, a pair of recesses 52 of a certain area are formed one on each side of the grip portion 29 of the pull tab 3 at the region where the pull tab 3 is likely to contact the slider body 2. A plurality of small through holes 53 are formed through the grip portion 29 of the pull tab 4 within the recesses 52. Then, the shock-absorbing member 50 is injection-molded from soft plastic within the recesses 52 so as to fill up the recesses 52 and swell or bulge on both upper and lower surfaces of the pull tab 4. As shown in Figure 5, the upper and lower parts of the shock-absorbing member 50 are joined through the small through holes 53. Since the shock-absorbing member 50 is embedded in the recesses 52 and will never get caught by extraneous things and the upper

and lower parts of the shock-absorbing member 50 are joined through the small through holes 53; the shock-absorbing member 50 will never be dislodged from the pull tab 3. Therefore, the shock-absorbing member 50 endures a long use and enjoys excellent muffling effects.

[0037] As better shown in Figure 13, the pull tab 4 has the shock-absorbing member 50 mounted in its region where the grip portion 29 of the pull tab 3 contacts the slider body 3 when the pull tab 3 rotates and pivots the slider body 2. Specifically, as shown in Figure 15, the two elliptical recesses 52 are formed one of each side of the grip portion 29 of the pull tab 3 between the attachment lugs 25 and the through hole 28 formed at the distal end of the grip portion 29. A plurality of small through holes 53 (two circular holes and one oblong hole disposed therebetween shown here) are formed through the grip portion 29 within the recesses 52. As better shown in Figure 16, the shock-absorbing member 50 is injection-molded from soft plastics on the both sides of the grip portion 29 so as to fill up the recesses 22 and swell or bulge on both sides of the pull tab 3. The upper and the lower parts of the shock absorbing member 50 are connected through the small through holes 53 formed within the recesses 52, so that the shock-absorbing member 50 is firmly mounted on the pull tab 3 against dislodgment. The shock-absorbing member 50 has a plurality of grooves 59 formed in the upper and lower sides thereof so as to extend laterally of the length of the pull tab 3. These grooves 59 are intended to facilitate gripping of the shock-absorbing member 50 and hence the grip portion 29 of the pull tab 3..

[0038] When the pull tab 3 rotates and pivots on the slider body 2, the fact that the shock-absorbing member 50 exists in the region where the pull tab 3 contacts the slider body 2 matters. Even if the pull tab 3 strikes heavily upon the slider body 2, the shock-absorbing member 50 advantageously prevents rattling noises from being caused or absorbs the rattling noises, thus achieving muffling effects.

[0039] Figure 17 shows double sliders 1 for a slide fastener according to the eighth embodiment of this invention. The double sliders 1 according to the eighth embodiment are substantially identical with the double sliders 1 according to the sixth embodiment except that the two sliders 1 have shock-absorbing members 50 mounted on their respective pull tabs 3, as better seen from comparison of Figures 11 and 17.

[0040] As shown in Figure 17, the two sliders 1 are brought into abutting engagement with each other with their respective front ends contacted with each other in order to close the slide fastener chain 6, and one of the pull tabs 3 is turned over against the other with their respective through holes 28 in registry with each other. Then, the shackle 35 of the padlock 34 is inserted through the through holes 28 of the pull tabs 3 and locked. Since the pull tabs 3 of the two sliders 1 are locked with the respective shock-absorbing members

50 interposed therebetween, the shock-absorbing members 50 of both pull tabs 3 prevent the pull tabs 3 from striking directly against each other and causing rattling noises, thus accomplishing muffling effects. In addition, the shock absorbing member 50 of each pull tab 3 prevents the respective pull tab 3 from directly striking against its respective slider body 2 and causing rattling noises, as well.

[0041] With this construction of the present invention, even after the slide fastener is incorporated in a certain article such as clothing or bags, only the pull tab can be advantageously replaced at great ease without the fastener chain left intact.

[0042] Since the shapes of the mounting hole and the attaching pole are both very simple in construction, the manufacture and assemblage of the parts can be made at ease.

[0043] Even if the pull tab 3 contacts the slider body 2 during operation or by vibration of the slide fastener, the shock-absorbing member 50 always goes between the pull tab 3 and the slider body 2, thus absorbing or decreasing rattling noises, thus accomplishing muffling effects with a simple mechanism.

[0044] A slider according to the present invention is mounted on a slide fastener used for various kinds of articles such as clothing, bags, cases. Even when the slide fastener has been incorporated in such articles, a pull tab can be replaced at great ease. This slider can be also used in a so-called double-slider type slide fastener wherein two sliders are reciprocally mounted on a single fastener chain and disposed reversely to each other. After the fastener is closed, the pull tabs of both sliders can be locked by a shackle of a padlock.

[0045] If equipped with a smaller pull tab, a slider according to the present invention is suitable for use on sport wares, personal belongings, small bags, small cases or the like. If quipped with a bigger pull tab, it is suitable for use on a shoulder bag or the like. Furthermore, a pull tab in rectangular shape can be used on an auto-locking type slider.

[0046] Although the description above contains many specificities, these should not be construed as limiting the scope of the invention but as merely providing illustrations of some of the presently preferred embodiments of this invention. Many other variations are possible

[0047] Thus the scope of the invention should be determined by the appended claims and their legal equivalents, rather than by the examples given.

Claims

1. A slider (1) reciprocally mounted on a slide fastener chain (6), comprising: a slider body (2) including a guidepost (12) having a mounting hole (13) formed therethrough; an attaching pole (4) having a large-diametered portion (20) formed at its one end; the attaching pole (4) inserted upwardly through the

mounting hole (13) and rotatably mounted on the slider body (2); and a pull tab (3) including a grip portion (29) and two attachment lugs (25) formed by bifurcating the proximal end of the pull tab (3), the attaching lugs (25) having their respective pin apertures (26) formed in alignment with each other; **characterized in that** the attaching pole (4) has a pin hole (21) formed at the other end so as to extend laterally therethrough; that the pin hole (21) lies beyond the upper surface of the slider body (2) and that the slider further includes a pin (5) inserted into the pin hole (21) of the attaching pole (4) and the pin apertures (26) of the pull tab (3), so that the pull tab (3) is pivotally mounted on the attaching pole (4).

2. A slider (1) recited in claim 1, wherein the mounting hole (13) has a countersink 14 formed on its lower end.
3. A slider (1) recited in claim 1, wherein the mounting hole (13) has countersinks 14 formed on the upper and lower end, respectively, thereof.
4. A slider (1) recited in claim 1, wherein a raised rim (15) is formed around the mounting hole (13) on each of the upper and lower surface of the slider body (2).
5. A slider (1) recited in claim 1, wherein the pin (5) is cylindrical and has a slit (31) formed axially throughout its length, and the pin hole (21) has a narrowed portion (22) formed at its middle in the shape of an inner projection projecting inward from its inner surface so as to fasten pin (15) through its own resiliency.
6. A slider (1) recited in claim 1, wherein the slider body (2) has a flat lower surface, and the large-diametered portion (20) being in the shape of a thin disk which is flat at its inner and outer surfaces so that the large-diametered portion (20) is adapted to intimately contact the lower surface of the slider body (2).
7. A slider (1) recited in claim 1, wherein the mounting hole (13) is in the shape of a truncated cone, and the attaching pole (4) is complementarily in the shape of a truncated cone.
8. A slider (1) recited in claim 1, wherein, as viewed in the profile, the pull tab (3) is bent obtusely at a bent portion (27) which is adjacent to the attachment lugs (25).
9. A slider (1) recited in claim 1, wherein an additional slider (1) is reciprocally mounted on the fastener chain (6), so that the two sliders (1) are disposed

reversely to each other on the fastener chain (6), the pull tab (3) of one slider (1) being bent obtusely at a bent portion (27) which is adjacent to the attachment lugs (25) in reverse direction relative to the pull tab (27) of the other slider (1), each pull tab (3) having a through hole 28 formed therethrough adjacent to its distal end, so that when both sliders (1) come into abutting engagement to each other to close the slide fastener chain (6), said one pull tab (3) can be turned over flat against said other pull tab (3), with their respective through holes 28 in registry with each other.

10. A slider (1) recited in claim 1, wherein the slider body (2) and pull tab (3) are made of hard material; the slider (1) further including a shock-absorbing member (30) made of soft material and mounted on the pull tab (3) at its region where the pull tab (3) contacts the slider body (2), so as to bulge on both upper and lower surfaces of the pull tab (3).
11. A slider (1) recited in claim 10, wherein the shock-absorbing member (50) is mounted on the grip portion (20) of the pull tab (4).
12. A slider (1) for a slide fastener recited in claim 10, wherein the grip portion (20) has a recess (22) formed therein adjacent to the attachment, lugs (18), and a plurality of small through holes (23) formed through the grip portion (29) within the recess (22); the shock-absorbing member (50) being mounted in the recess (22).
13. A slider (1) recited in claim 9, the slider body (2) and pull tab (3) of each slider (1) are made of hard material; each slider (1) further including a shock-absorbing member (30) made of soft material and mounted on the pull tab (3) at the region where the pull tab (3) contacts the slider body (2), so as to bulge on both upper and lower surfaces of the pull tab (3).

FIG. 1

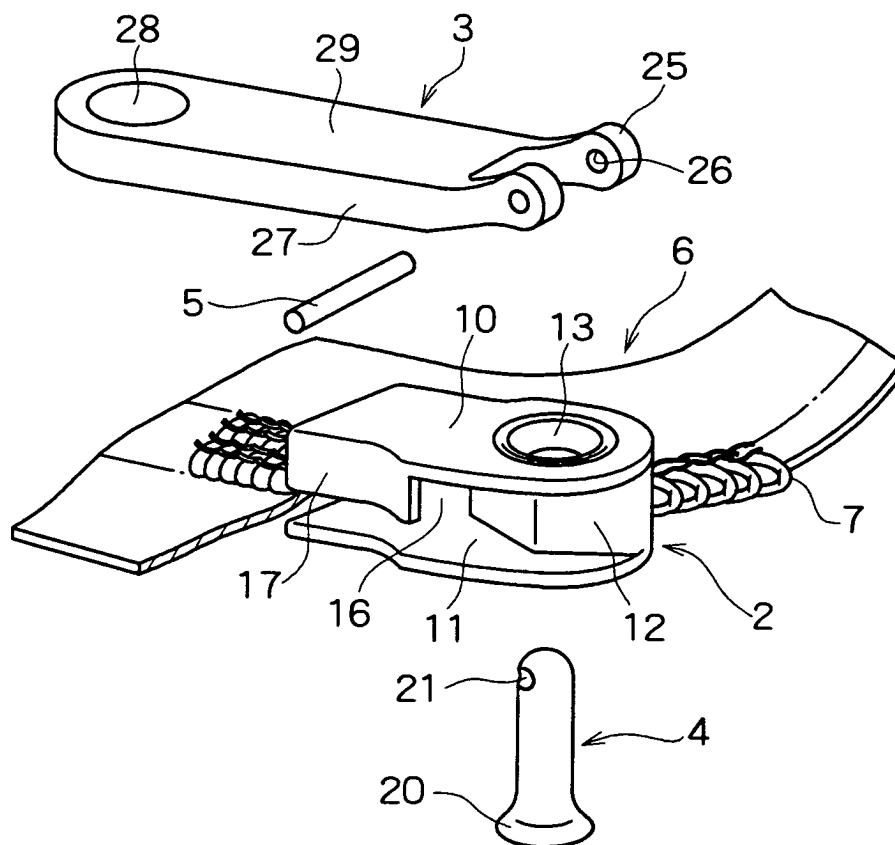


FIG. 2

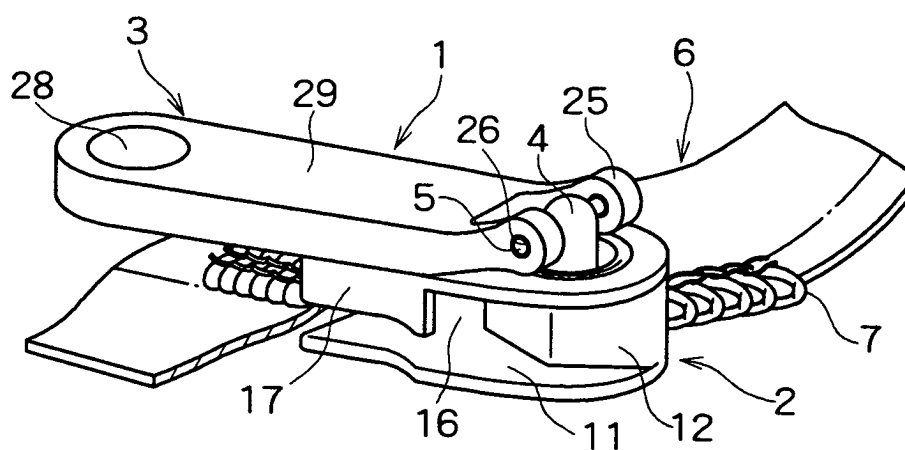


FIG. 3

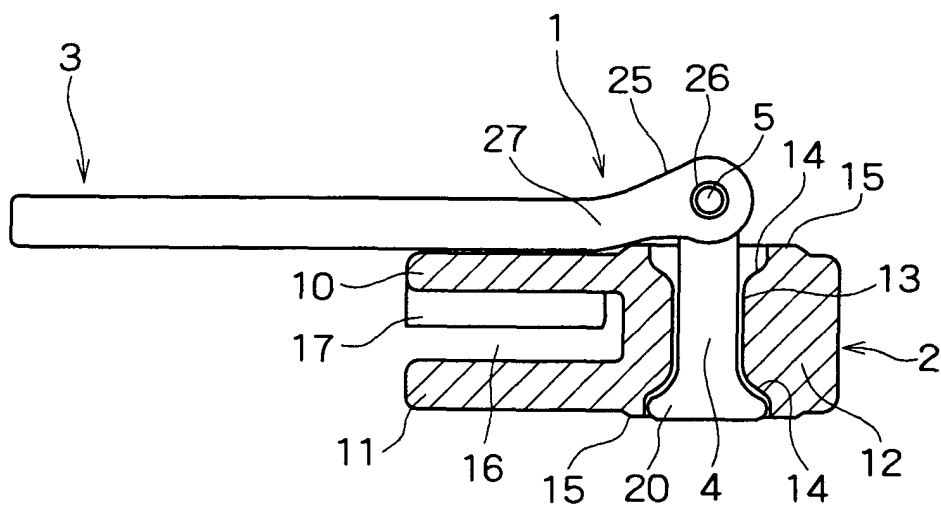


FIG. 4

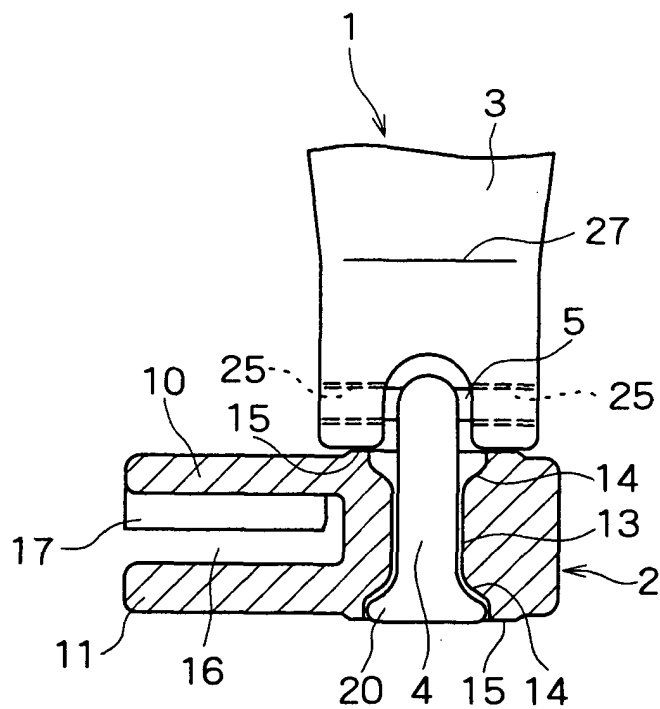


FIG. 5

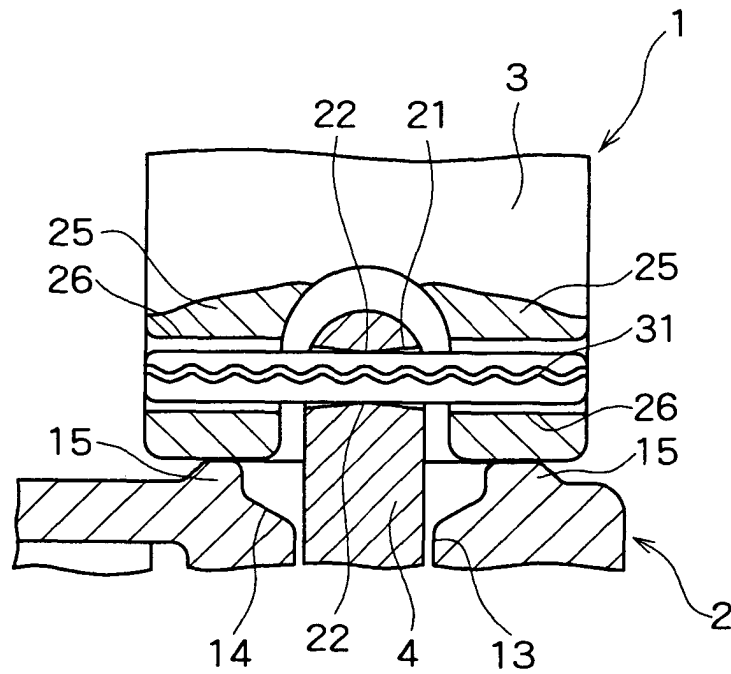


FIG. 6

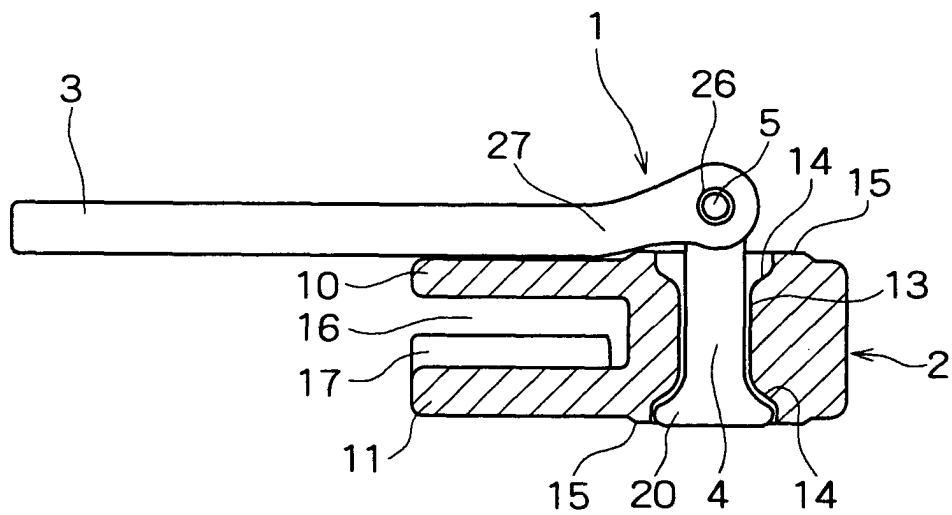


FIG. 7

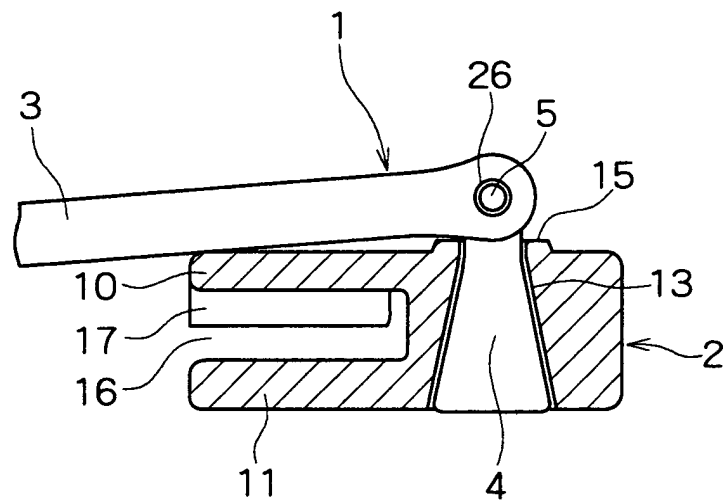


FIG. 8

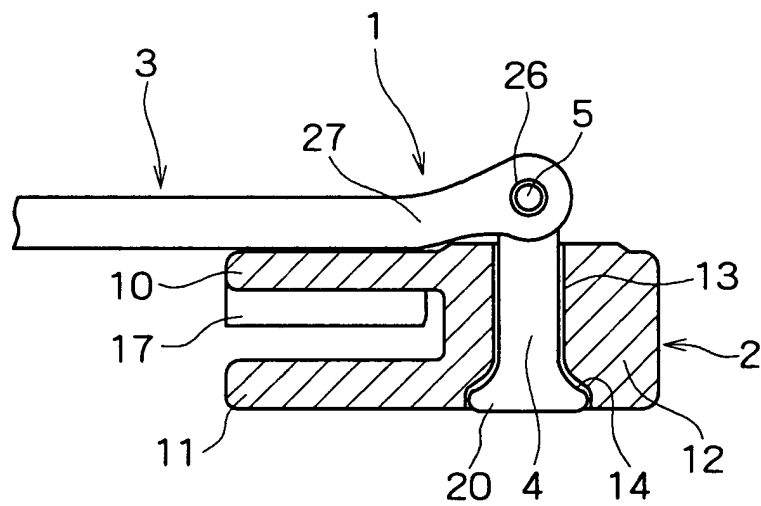


FIG. 9

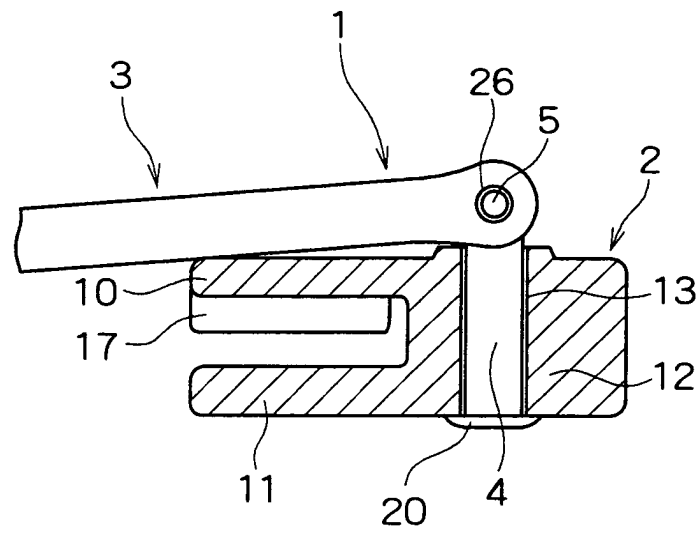


FIG. 10

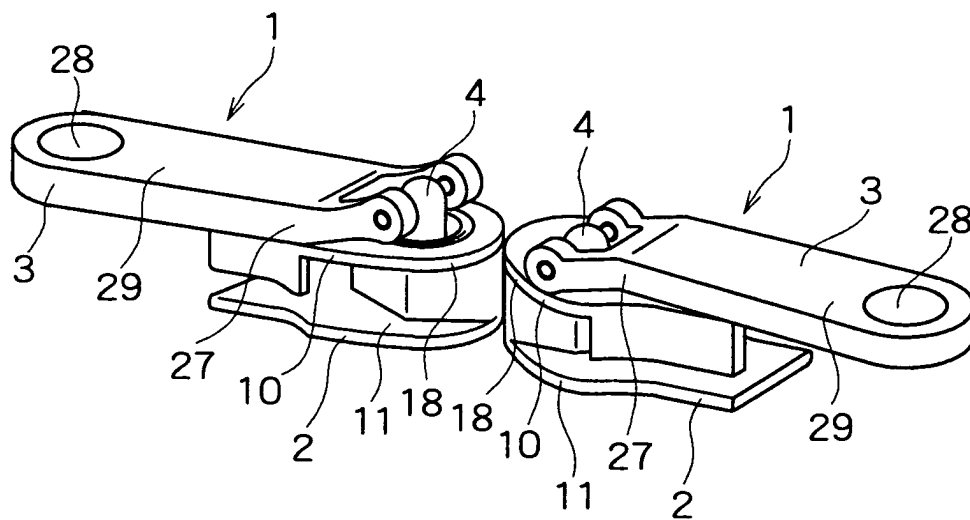


FIG. 11

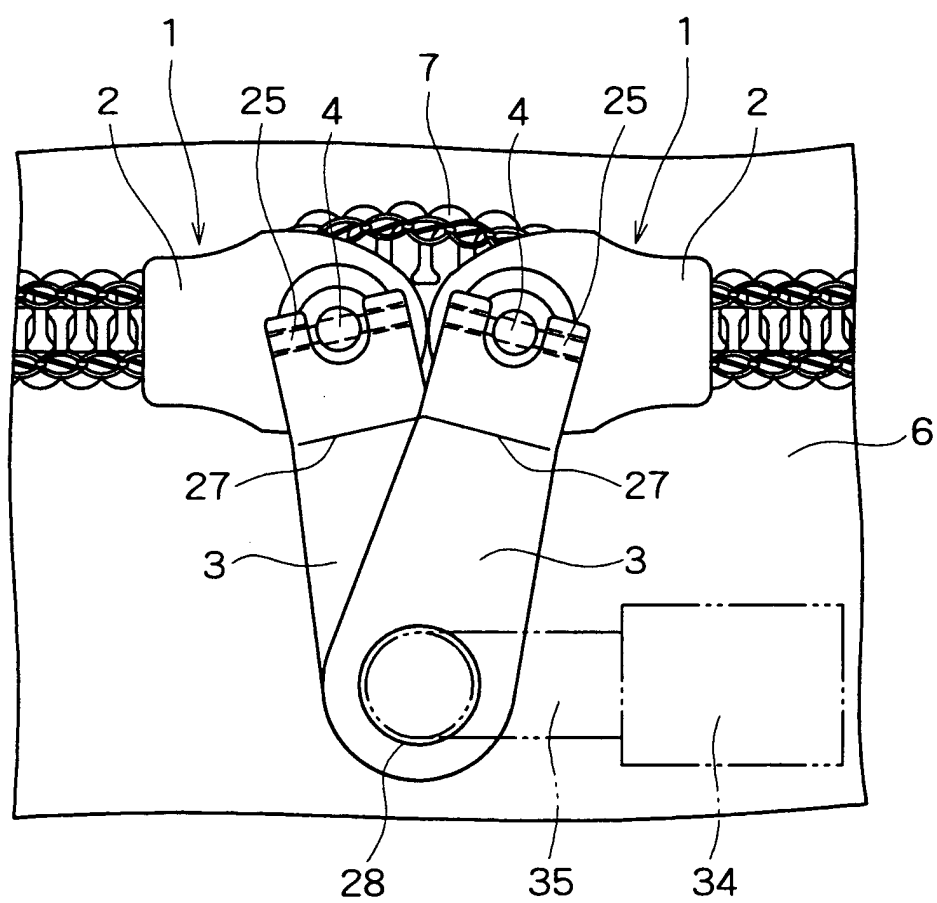


FIG. 12

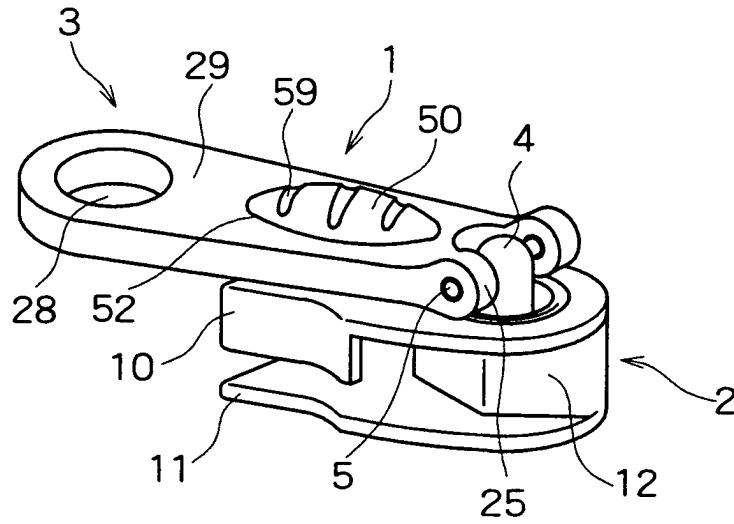


FIG. 13

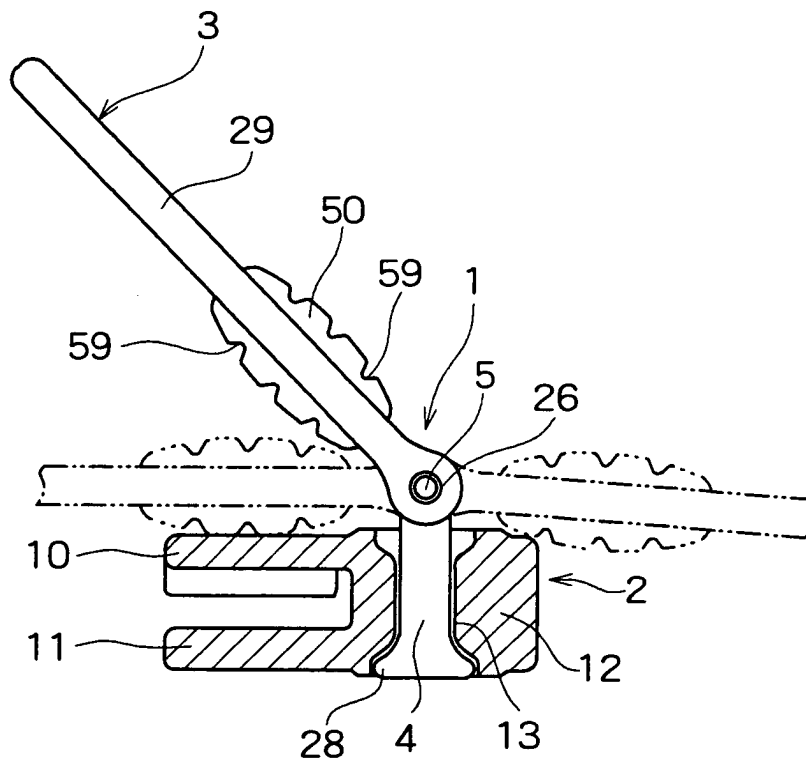


FIG. 14

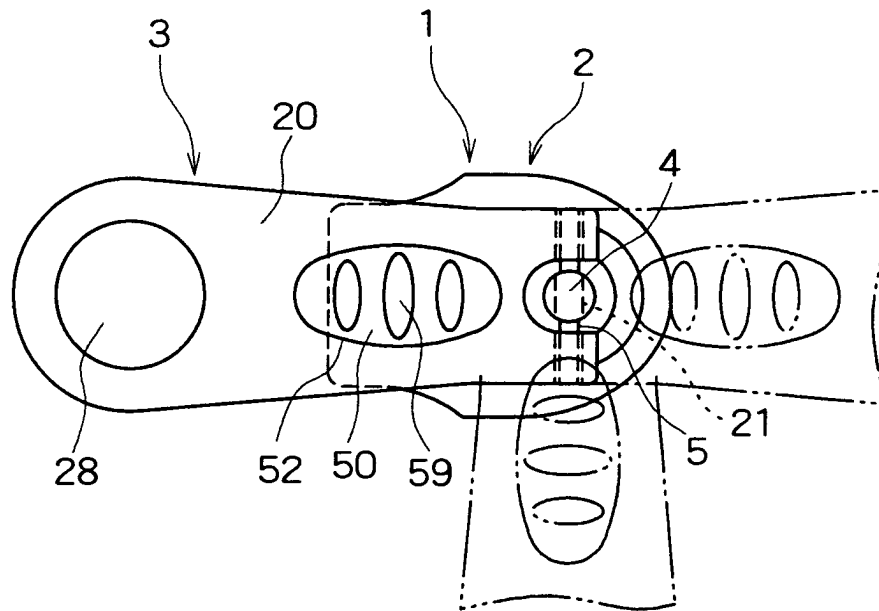


FIG. 15

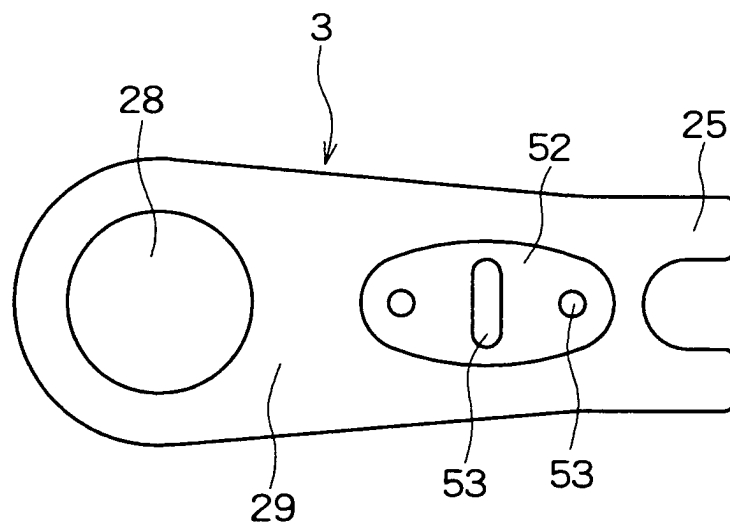


FIG. 16

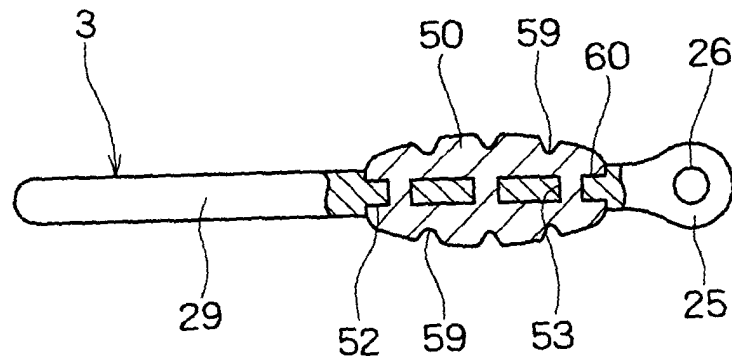


FIG. 17

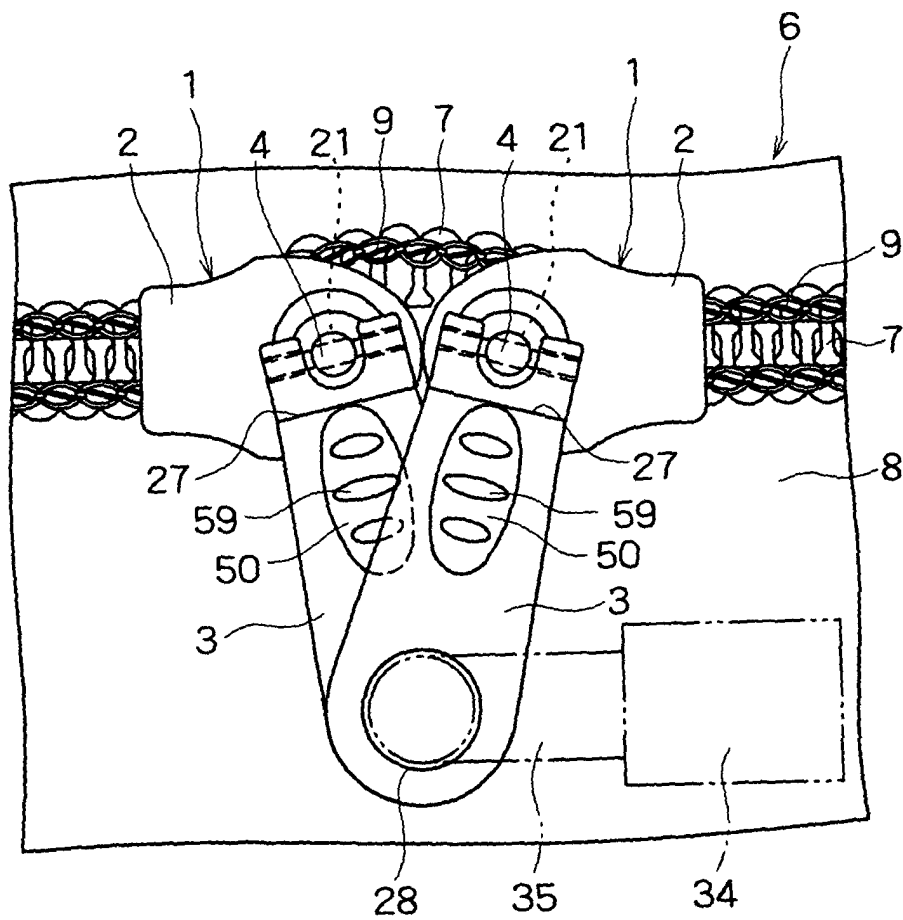


FIG. 18

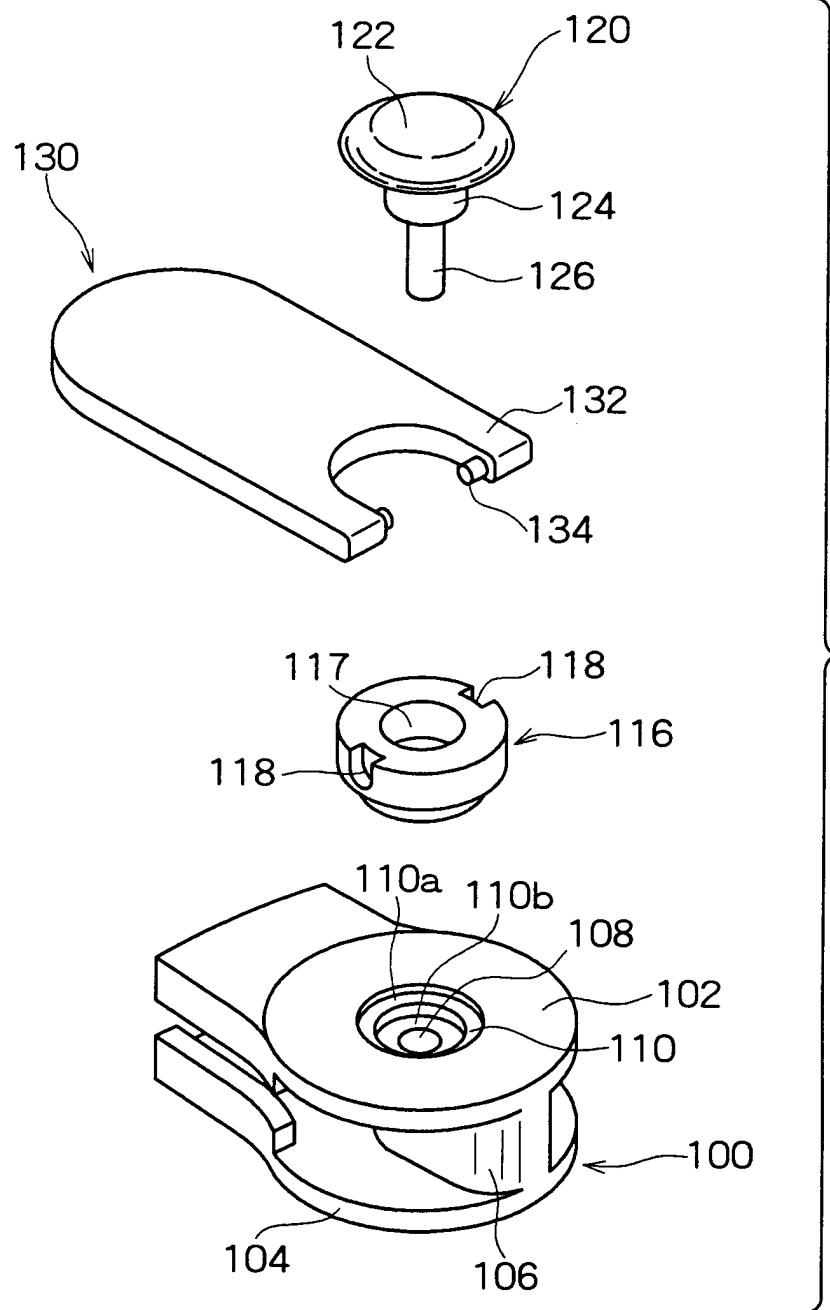


FIG. 19

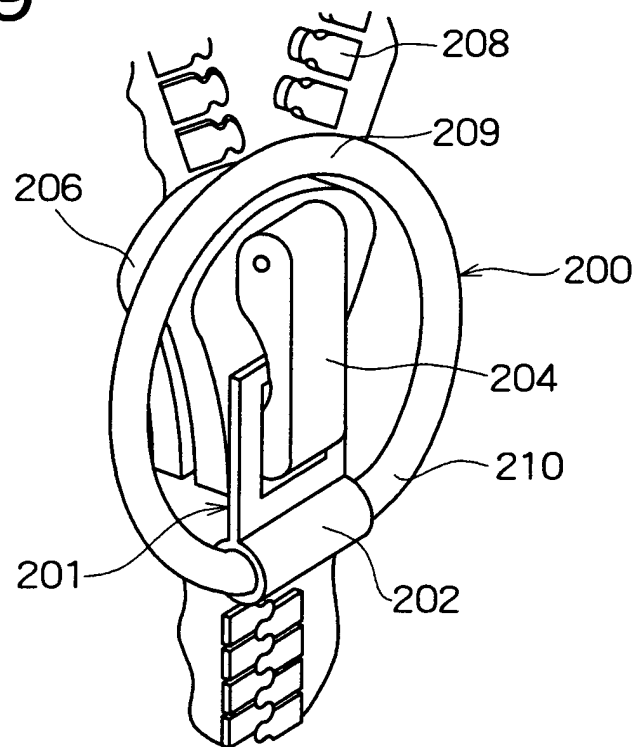
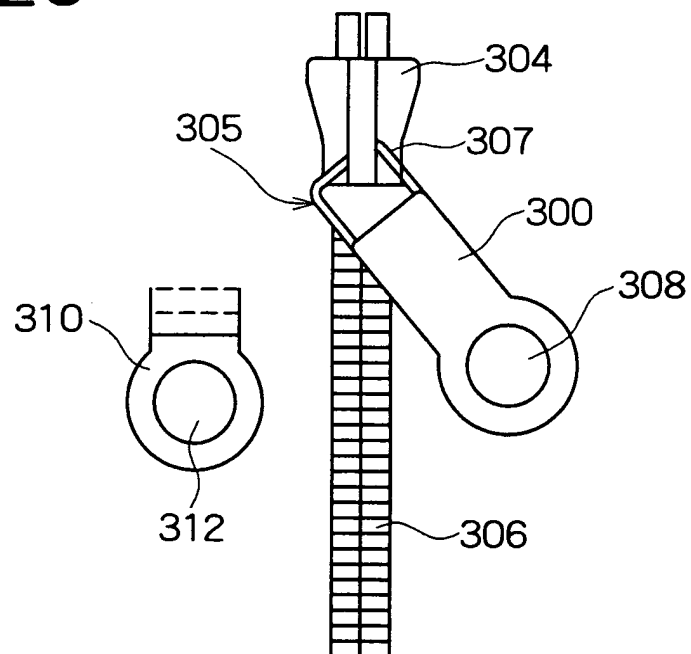


FIG. 20





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 04 25 7195

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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 3 March 2005	Examiner Horubala, T
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