

DEVICE FOR PULLING UP SLIDER OF A SLIDE FASTENER CHAIN

This invention relates to a slider pull-up device
5 used in a process for manufacturing slide fasteners. More particularly, the invention relates to a device operable during the longitudinal travel of a slide fastener chain to pull a slider slidable along the chain up to a predetermined position, the slide fastener chain being in the form of
10 a continuous strip having spaced slide fastener units provided longitudinally therealong.

A device for temporarily engaging and pulling up solely the slider of a slide fastener chain during longitudinal
15 dinal travel of the chain is disclosed in, for example, the specification of Japanese Patent Publication 58-17000 (U.S. Patent 4,250,781). The disclosed slider pull-up device has a through-hole which permits the slide fastener chain to travel longitudinally therethrough and is provided with two
20 horizontal fingers bracketing the through-hole and urged toward each other at all times so as to resiliently grip the slider from both sides thereof. As the slide fastener chain is moved, the slider engaged by these fingers is pulled up slidably until coming into abutting contact with a top end
25 stop. The advancing movement of the slide fastener chain causes the slider to be forcibly freed from the fingers at the position of the top end stop so that the slider and the end stop may move past the fingers.

Since the slider is pulled up to the position of the
30 top end stop by the conventional slider pull-up device as described, the slider is brought into close proximity to a cutting region at which the slide fastener chain is subsequently severed at a space portion thereof. As a result, the slider tends to obstruct the severance of the chain. In
35 particular, the pull tab of the slider is likely to project into the space portion at which the cut is made, thereby making it impossible to sever the chain at the space portion.

According to the present invention there is provided a device for pulling up a slider of a long slide fastener chain formed on a pair of longitudinally opposed tapes and having a plurality of slide fastener units, comprising:

5 a chain guide having a passageway for allowing passage therethrough of a slide fastener chain having a slider slidably mounted thereon;

a pair of slider engaging fingers arranged to oppose each other from opposite sides of the passageway for being thrust into and withdrawn from said passageway; and

10 a finger actuating mechanism for thrusting said pair of fingers into the passageway and withdrawing said pair of fingers from said passageway in operatively associated relation.

In a preferred embodiment of the present invention there is provided a slider pull-up device having a pair of slider gripping fingers each of which is provided on either side of a slider guide groove in a chain groove forming a passageway which allows a slide fastener chain having a slider slidably mounted thereon to pass guidably therethrough. The fingers are operatively associated with each other and coupled to an actuating mechanism which thrusts the fingers into the passageway to grip a slider and pull the slider up to a predetermined position as the slide fastener chain advances through the passageway, and which then withdraws the fingers from the passageway to release their grip on the slider so that the slider may pass through the passageway with the rest of the travelling fastener chain.

20 The slider pull-up device may be adapted to project the slider gripping fingers into and withdraw them from the slider guide groove by means of the actuating mechanism so that the slider may be gripped and released at will. By operating the actuating mechanism under a preselected control schedule, the slider can be pulled up to the predetermined position before contacting the top end stop.

25 It is believed possible by means of the present invention to provide a slider pull-up device in which the fingers for engaging the slider are capable of being controlled at will to terminate slider pull-up at a predetermined position before the slider abuts against the top end stop.

The predetermined position mentioned above may be so selected

that the pull tab of the slider will not reach the space portion even if it reclines in the direction of the space portion after the slider is pulled up.

The invention will be described by way of example with reference
5 to the accompanying drawings, wherein:-

Fig. 1 is a perspective view of a slider pull-up device embodying the present invention, with a principal portion thereof being shown in section;

Fig. 2 is a plan view of the slider pull-up device

a portion whereof is deleted;

Figs. 3 and 4 are sectional views showing operating states of the slider pull-up device; and

Fig. 5 is a plan view illustrating the relationship between a slide fastener chain and a pair of fingers for gripping the slider.

Fixedly secured to a base 1 is a chain guide plate 2 on the upper surface of which a fastener chain presser 3 is pivotally supported. The fastener chain presser 3 is urged at all times toward the base 1 by a spring 4. The chain guide plate 2 is formed to include a slider guide groove 5 for guiding a slider therethrough. A pair of fingers 6, 6' for engaging and gripping a slider therebetween are slidably mounted on the chain guide plate 2, one on each side of the slider guide groove 5. A sliding rod 7 has one end connected to the operating end of an air cylinder 8. Also connected to the operating end of the air cylinder 8 is the finger 6. A rocking lever 10 is pivotally supported on a pin 9. Loosely connected to one end of the lever 10 is the end of the finger 6' opposite the slider guide groove 5. Loosely connected to the other end of the lever 10 is the other end of the sliding rod 7. The fingers 6, 6' are thus operatively associated with each other in such a manner that actuating the air cylinder 8 causes the fingers 6, 6' to recede from both sides of the slider guide groove 5, as shown in Fig. 3, or to project into the groove 5 from both sides thereof, as shown in Fig. 4.

The chain guide plate 2 and fastener chain presser 3 form a chain guide. The upper surface of the slider guide groove 5 formed in the chain guide plate 2, the upper surfaces of the fingers 6, 6' and the lower surface of the fastener chain presser 3 define a passageway H which, as shown in Fig. 3, includes a comparatively narrow, deep, centrally located slider passage that allows the guided passage therethrough of a slide fastener chain having a slider slidably mounted thereon, and a comparatively wide, shallow tape passage provided on each side of the slider

passage and communicating therewith for allowing the passage therethrough of the corresponding tape of the slide fastener chain.

As shown in Fig. 5, a long slide fastener chain C, which is formed on a pair of longitudinally opposed tapes, has a plurality of slide fastener units U, U, each of which has a top end stop T, a bottom end stop or retainer B and a slider S with a pull tab P. L represents a cutting position located at a spaced portion provided between the slide fastener units U, U.

The slider pull-up device having the foregoing construction is disposed and used at a suitable position in the path of travel of the slide fastener chain C to pull the slider S up to a predetermined position. Specifically, with the pull-up device installed, the fastener chain presser 3 is raised to the position indicated by the phantom line 3' in Fig. 3 to allow the slide fastener chain to be passed guidably through the passageway H. Thereafter, the slide fastener chain C is moved in the direction of the arrow A and the air cylinder 8 is actuated so as to thrust the fingers 6, 6' forward into the slider guide groove 5, as shown in Fig. 4, thereby to engage, grip and pull up the slider S as the slide fastener chain advances. At the moment the slider S is pulled up to the predetermined position, the air cylinder 8 is actuated to operate in the reverse direction, thereby causing the fingers 6, 6' to retract from the slider guide groove 5 and, hence, release their grip on the slider S so that the slider may pass through the guide groove 5 as the slide fastener chain advances.

The slide fastener chain C having its slider S pulled up to the predetermined position in the above manner is introduced to a cutting process, where the fastener chain C is severed along the cutting line L at the space portion to separate a discrete slide fastener from the chain.

It should be noted that the air cylinder 8 in the illustrated embodiment of the invention may be substituted by other actuating means such as a hydraulic cylinder or

electromagnetic solenoid.

Thus, the fingers for engaging the slider are positively controlled by an actuating mechanism so as to be withdrawn from the slider to enable the slider to be pulled up to a predetermined position. This makes it possible to avoid problems when cutting the slide fastener chain C. Moreover, since the slider is not subjected to excessive force by the fingers 6, 6', the slider is not damaged or flawed.

**Claims:**

1. A device for pulling up a slider of a long slide fastener chain formed on a pair of longitudinally opposed tapes and having a plurality of slide fastener units,
5 comprising:
a chain guide having a passageway for allowing passage therethrough of a slide fastener chain having a slider slidably mounted thereon;
a pair of slider engaging fingers arranged to oppose
10 each other from opposite sides of the passageway for being thrust into and withdrawn from said passageway; and
a finger actuating mechanism for thrusting said pair of fingers into the passageway and withdrawing said pair of
15 fingers from said passageway in operatively associated relation.
 2. A device according to Claim 1, wherein said chain guide comprises a chain guide plate having a slider guide groove, and a fastener chain presser, said chain guide plate and said fastener chain presser defining said passageway,
20 said passageway including a centrally located slider passage of a width and depth that allow passage of a slider there-through, and a tape passage provided on each side of said slider passage and communicating therewith, said tape passage being greater in width and shallower in depth than the
25 width and depth, respectively, of said slider passage for allowing passage of the corresponding tape therethrough.
 3. A device according to claim 1 or 2, capable of operation in such a manner as to pull the slider only part-way up the chain, with the fingers thrust into the passageway and engaging the slider,
30 and then to release the slider by withdrawal of the fingers.
 4. A device substantially as described with reference to and as illustrated in the accompanying drawings.
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