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MECHANISM FOR ASSEMBLING SLIDER TO SLIDE FASTENER CHAIN

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FIG. 1

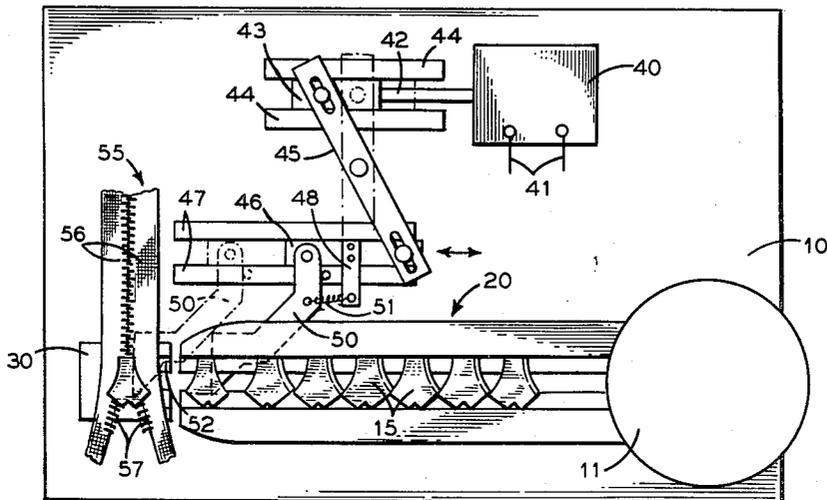


FIG. 4

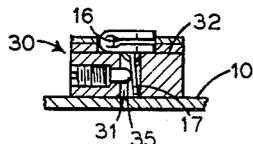


FIG. 2

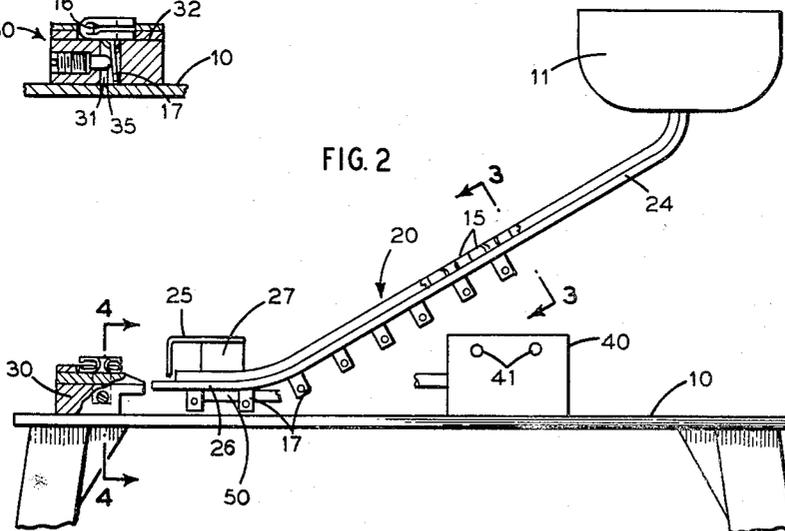
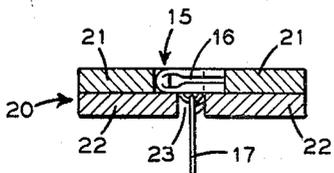


FIG. 3



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4 Claims. (Cl. 29—211)

This invention relates to slide fasteners and, more particularly, to novel mechanism for facilitating the mounting of sliders on slide fasteners constructed as a "chain" of individual slide fasteners.

In the manufacture of separable slide fasteners, series of slide fastener teeth are secured along the edges of tapes or stringers which form the two sections of the slide fastener, the teeth being engaged or disengaged by movement of a slider therealong. The modern technique is to feed a pair of relatively elongated tapes in side by side relation through a machine which progressively secures the cooperating teeth simultaneously to the facing edges of both tapes, with the teeth of the two tapes being assembled in interlocked relation.

The teeth are arranged in longitudinally spaced groups along the tapes, the lengths of the groups being determined by the desired lengths of the individual slide fasteners. The groups of teeth are separated by portions of the tapes not having any teeth secured thereto. The resultant elongated slide fastener element is commonly referred to as a "chain."

The sliders for operating these fasteners comprise a pair of substantially parallel flat wings interconnected by a yoke which, with the wings, forms a Y shape guide structure for guiding the teeth into and out of interlocked relation along outwardly facing channels on the sides of the sliders. One of the wings is provided with a pull tab for operating the slider.

To assemble sliders to the chain of separable fasteners, an operator laterally spreads the tapes between adjacent interlocked groups of teeth places the slider in the opening thus formed, guides the tape into the slider side channels, and then pulls the slider along the tapes to engage the teeth of a slide fastener unit. This is a time consuming operation which increases the labor cost of manufacturing the slider. Consequently, many attempts have been made to feed sliders from a magazine automatically to spaced portions of the chain, and assemble the sliders automatically on the slide fastener units. However, fully automatic machines of this type have been complicated, expensive, and subject to considerable maintenance expense, thus mitigating the advantages of their automatic operation.

In accordance with the present invention, the assembling of such sliders to chains of separable fasteners is facilitated and greatly expedited without the expense and complications involved in such fully automatic apparatus. More specifically, the invention is directed to what might be termed a semi-automatic apparatus in which sliders are fed from a hopper to a feed track having a slot through which the tabs of the sliders depend. At the end of this track is an anvil arranged to receive and releasably retain one slider at a time.

The apparatus is controlled by a master switch, preferably foot operated. Each time this switch is closed, a solenoid is energized to operate linkage moving a finger against the leading slider to push this slider into the anvil against the holding force of a light spring latch normally

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engaged with the leading slider. The anvil has a surface on which the slider rests, and a slot receiving the slider tab. A spring pressed detent engages the tab to hold the slider on the anvil.

The operator pulls a chain of slide fasteners wound on a reel to position a space between successive fasteners over the slider on the anvil with the tapes entering the slider guide rails. The operator then pulls the chain to engage the slider with a slide fastener, and then lifts the chain to pull the slider out of the anvil. The control switch is then operated and the work cycle repeated.

For an understanding of the invention principles, reference is made to the following description of a typical embodiment thereof as illustrated in the accompanying drawing. In the drawing:

Fig. 1 is a partial top plan view of apparatus embodying the invention;

Fig. 2 is a side elevation view thereof;

Fig. 3 is a sectional view on the line 3—3 of Fig. 2;

Fig. 4 is a sectional view on the line 4—4 of Fig. 2.

Referring to the drawings, the apparatus is mounted on a suitable table or other elevated support surface 10 and includes an elevated hopper 11 arranged to contain a supply of sliders 15 having tape guide channels 16 and pull tabs 17. Hopper 11 feeds the sliders to a track 20 comprising spaced parallel rails comprising bars 21 and plates 22 extending inwardly beyond bars 21 and separated to provide a slot 23. Bars 21 engage the opposite ends of sliders 15, with tabs 17 having a loose guiding fit in slot 23 so as to depend below track 20. The sliders travel by gravity down a sloping portion 24 of track 20 and onto a short horizontal section 26.

Adjacent the end of track 20, a light spring 25, mounted on a support 27, engages and releasably restrains the leading slider. Track 20 extends to an anvil 30, on support 10, having a slot 31 opening downwardly from a support surface 32. When a slider 15 is on support surface 32, its tab 17 lies in slot 31 and is engaged by a rounded end spring pressed plunger 35. This frictionally holds the slider in position.

The leading slider 15 is moved onto anvil 30 by energization of a solenoid 40 effected by a control switch, preferably foot-operated, controlling connection of solenoid leads 41 to a source of electric potential. As the switch is conventional, it has not been illustrated. The plunger 42 of solenoid 40 is connected to a slide 43 reciprocable in parallel guide blocks 44. A lever 45 is pivotally mounted on support 10 for movement parallel thereto, and one end of lever 45 has a pin and slot connection to slide 43.

The other end of lever 45 has a pin and slot connection to a slide 46 reciprocable in parallel guide blocks 47 adjacent track 20. Slide 46 has fixed thereto a projecting arm 48 connected by a spring 51 to a finger 50 pivoted on slide 46. Finger 50 has a wedge shape free end 52 normally engaged behind the tab 17 of the leading slider 15.

The apparatus operates as follows. The slider 15 more sequentially from hopper 11 down track 20 onto portion 26 where the leading slider is engaged by spring 25. When the operator closes the control switch, solenoid 40 is energized to retract its plunger 42 which is normally spring biased outwardly. This swings lever 45 clockwise, as viewed in Fig. 1, so that slide 46 is moved toward anvil 30. The end 52 of finger 50, engaged behind tab 17 of the leading slider 15, pushes this slider onto anvil 30 and its tab 17 into slot 31 where it is frictionally held by button or pin 35. Spring 25 rides over the slider in this movement. When the control switch opens, lever 45 is swung counterclockwise to retract slide 46. Finger 50

pivots clockwise so that its end 52 rides over the tab 17 of the next slider and engages therebehind.

The operator now pulls a "chain" 55 from a reel at the back of the machine, spreads tapes 56 between adjacent interengaged series of teeth, guides tapes 56 into slider channels 16, pulls the "chain" to engage the slider with teeth 57, and then lifts the chain to pull the assembled slider away from anvil 30 and its frictionally held tab 17 out of slot 31. The operating cycle is then repeated.

The described apparatus is simple and rugged in construction and operation and not subject to excessive maintenance. Yet, as compared to hand assembly of sliders to "chains," the rate of assembly is increased manifold.

While specific embodiments of the invention have been shown and described in detail to illustrate the application of the invention principles, it will be understood that the invention may be embodied otherwise without departing from such principles.

What is claimed is:

1. Mechanism for assembling sliders to separable slide fasteners of the type including a pair of tapes or stringers with interengaged teeth along their inner edges, comprising, in combination, a hopper arranged to contain a supply of sliders each having a pull tab; a track extending downwardly from the outlet of said hopper for gravity delivery of sliders from the hopper, said track including spaced parallel rails defining a narrow slot for endwise movement of the slider tabs along the track in depending relation to the sliders; an anvil aligned with the lower end of said track and having a slider support surface and a pull tab receiving slot aligned with the track slot; means releasably maintaining the leading slider on the track spaced from said anvil; movable means engaged behind the depending pull tab of such leading slider and operable, when actuated to push the leading slider onto the anvil with its tab in the anvil slot; a plunger spring pressed into the anvil slot to engage and frictionally retain a pull tab in the anvil slot; and whereby an operator may engage the laterally separated tapes of a slide fastener in the channels of the slider on the anvil, pull the tapes longitudinally to mesh such slider with the teeth, and lift the tapes to release the assembled slider from the anvil.

2. Mechanism for assembling sliders to separable slide fasteners of the type including a pair of tapes or stringers with interengaged teeth along their inner edges, comprising, in combination, a hopper arranged to contain a supply of sliders each having a pull tab; a track extending downwardly from the outlet of said hopper for gravity delivery of sliders from the hopper, said track including spaced parallel rails defining a narrow slot for endwise movement of the slider tabs along the track in depending relation to the sliders; an anvil aligned with the lower

end of said track and having a slider support surface and a pull tab receiving slot aligned with the track slot; means releasably maintaining the leading slider on the track spaced from said anvil; movable means engaged behind the depending pull tab of such leading slider and operable, when actuated to push the leading slider onto the anvil with its tab in the anvil slot; whereby an operator may engage the laterally separated tapes of a slide fastener in the channels of the slider on the anvil, pull the tapes longitudinally to mesh such slider with the teeth, and lift the tapes to release the assembled slider from the anvil; said movable means comprising a pivoted lever having an end movable toward and away from said anvil; and a finger pivoted on such lever end to engage behind the tab of the leading slider and ride over the tab of the next slider upon return movement of said lever.

3. Mechanism for assembling sliders to separable slide fasteners of the type including a pair of tapes or stringers with interengaged teeth along their inner edges, comprising, in combination, a hopper arranged to contain a supply of sliders each having a pull tab; a track extending downwardly from the outlet of said hopper for gravity delivery of sliders from the hopper, said track including spaced parallel rails defining a narrow slot for endwise movement of the slider tabs along the track in depending relation to the sliders; an anvil aligned with the lower end of said track and having a slider support surface and a pull tab receiving slot aligned with the track slot; means releasably maintaining the leading slider on the track spaced from said anvil; movable means engaged behind the depending pull tab of such leading slider and operable, when actuated to push the leading slider onto the anvil with its tab in the anvil slot; whereby an operator may engage the laterally separated tapes of a slide fastener in the channels of the slider on the anvil, pull the tapes longitudinally to mesh such slider with the teeth, and lift the tapes to release the assembled slider from the anvil; said movable means comprising a lever pivoted intermediate its ends; a slide movable substantially parallel to said track and slidably and pivotally connected to one end of said lever; a selectively energized solenoid connected to the other end of said lever to move said slide toward and away from said anvil; and a finger pivoted on said slide end to engage behind the tab of the leading slider and ride over the tab of the next slider upon return movement of said lever.

4. Mechanism as claimed in claim 3 in which the other end of said lever is slidably and pivotally connected to a second slide connected to the plunger of said solenoid.

References Cited in the file of this patent

UNITED STATES PATENTS

2,287,263 Nedal ----- June 23, 1942