

PATENT SPECIFICATION

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(54) SLIDER ASSEMBLING DEVICE FOR SLIDE FASTENER CHAIN

(71) We, YOSHIDA KOGYO KABU-SHIKI KAISHA, of No. 1, Kanda Izumicho, Chiyoda-ku, Tokyo, Japan; a corporation duly organised under the laws of Japan, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to a device for assembling sliders on a slide fastener chain.

A number of slider assembling devices have hitherto been proposed, most of which are in the form of holders designed to put sliders manually one at a time in place thereon. This manual operation prior to assembly of sliders on a fastener chain is not time-consuming and tedious but also often fails to set the slider in proper position on the slider holder. More advanced prior art devices employ mechanical means actuated by motors for supplying and setting sliders successively in place, but such devices are complicated, space-taking and costly, and hence are not suitable where the assembly of sliders on the fastener chain is performed manually.

The present invention aims to provide a slider assembling device which is capable of mounting sliders in place on a slide fastener chain without resort to an external driving power source to feed the sliders to an assembling position.

According to the invention, there is provided a device for assembling on a slide fastener chain sliders of the type including a pull tab pivotally supported on a lug on the slider, which device comprises an elongated casing having an opening therein for accommodating a series of sliders that are transported by their own gravity when the device is in use, a guiding means disposed in said opening and guiding the movement of said series of sliders, a holding means integral with said guiding means and holding a leading one of said sliders in position for assembly on the slide fastener chain, resilient

means for releasably holding said leading slider, and means for arresting and preventing said series of sliders from moving backward during the assembling operation.

The invention will now be further described, by way of example, with reference to the accompanying drawings, in which:—

Figure 1 is a perspective view of one embodiment of a slider assembling device according to the invention with parts cut away for clarity;

Figure 2 is a side elevational view, partly broken away, of the device shown in Figure 1;

Figure 3 is a bottom plan view of the same; and

Figure 4 is a longitudinal cross-sectional view of a modification according to the invention.

Referring now to the drawings and Figure 1 in particular, there is shown a slider assembling device 10 according to a preferred embodiment of the invention, which device essentially comprises a vertically elongated, rectangular casing 11 which functions as a chute for a supply of sliders and which consists of opposed, spaced parallel side walls or panels 12, 13 inter-connected at one longitudinal edge by a rear wall member 14 extending to the full length of the casing 11. The side panels 12, 13 are provided at the opposite longitudinal edge with integral inwardly directed protuberances 15, 16 which are spaced apart by a slit 17 extending through the length of the casing 11 opposite to the rear wall member 14.

There is provided interiorly of the casing or chute 11 a longitudinally extending, substantially rectangular opening 18 formed by the side walls 12, 13 and rear wall 14, which opening is adapted to accommodate a series of sliders S transported by gravity from a suitable slider supply source (not shown) and which is subdivided by a guiding means later described.

Each of the sliders S illustrated in Figures 1, 2 and 3 has a top wing S₁ and a bottom

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wing S_2 interconnected at one end by a neck S_3 , and two pull tabs S_4 , S_5 pivotally connected to respective supporting lugs S_6 , S_7 projecting from the top and bottom wings S_1 , S_2 respectively.

In order to effect the transport of a series of these sliders S by their own gravity in a neatly aligned fashion, there is provided a guiding means 19 extending longitudinally of the chute 11 and positioned midpart of the opposed side panels 12, 13. The guiding means 19 consists of a pair of spaced apart rails 20, 21 projecting transversely into the opening 18 and defining therebetween a longitudinally extending guide slit 22. This slit 22 has a width large enough to accept the lug S_6 (or S_7) of the slider S movably therein. The rails 20, 21 each have thickness substantially corresponding to the spacing between the top wing S_1 and the pivotal end S_8 of the pull tab S_4 such that these parts of the slider S ride astride of the opposed rails 20, 21 during the sliding gravity movement of the sliders S therealong, as shown in Figure 1.

There is further provided a slider holding means 23 formed integrally with and extending from the lower end of the guiding means 19 for holding the sliders S in position during the assembling thereof on a slide fastener chain F . The holding means 23 assumes the form of a rake consisting of a pair of tongues 24, 25 tapering off along their outer edges towards their free ends as shown. The holding means 23 is deflected slightly arcuately with a minimum radius of curvature and has its free end curved slightly upwardly beyond a horizontal path of the slide fastener chain F . The holding means 23, which is an extension of the guiding means 19, can be so formed by virtue of the arrangement in which the series of sliders S are supported in their gravity movement by the guide rails 20, 21 which project into the spacing between the top wing S_1 and the pivotal end S_8 of the sliders S as previously described. As the leading slider S' in the train of sliders S advanced by gravity along the guide rails 20, 21 arrives at the holding means 23 adjacent to the free end thereof, it is resiliently retained in place thereat by spring members 26, 27 attached at one end to the side panels 12, 13, respectively. More specifically, the spring members 26, 27 extend beneath the tongues 24, 25 and have their free end portions 26', 27' normally biased inwardly towards each other. These end portions 26', 27' are arranged to be parallel with the upwardly curved end portions 24', 25' of the tongues 24, 25 and configured to conform to the peripheral contour of the side flanges S_9 of the slider S , so that the spring members 26, 27 can snugly fit with the slider S when retaining

the latter in position during the threading thereof through the fastener chain F .

The leading slider S' to be assembled on the fastener chain F is thus retained resiliently in place by the spring members 26, 27 and disposed with its exit end S_{10} upwardly inclined so that the operator can see clearly through the guide channel of the slider S' when passing the fastener chain F therethrough. The next following slider S'' is so guided along the curved plane of the holding means 23 that its exit end S_{10} is conversely tilted downwardly to avoid interference with the path of movement of the fastener chain F that has been threaded through the preceding or leading slider S' as better depicted in Figure 2.

While, in the illustrated embodiment, the sliders S are arranged to be mounted on the fastener chain F through their exit end S_{10} , it is of course possible to change their feeding position such that the fastener chain F is introduced through the entrance end S_{11} of the slider S with similar results.

As shown in Figure 1 and better seen in Figure 2, the rear wall member 14 is provided with a series of spaced inwardly projecting ledges 28 in the form of a ladder for holding the sliders S against the backward movement thereof which would otherwise take place under the influence of pressure exerted when drawing the fastener chain F through the leading slider S' . More specifically, the pull tab S_5 on the bottom wing S_2 of the slider S is arrested between adjacent ledges 28 of the rear wall member 14 during the assembling operation.

The pull tabs S_4 on the front wings S_1 are held simply in sliding relation to the protuberances 15, 16 of the side panels 12, 13 during the transport of the sliders S along the guide rails 20, 21.

In operation, the leading slider S' after being assembled is simply pulled together with the fastener chain F against tension of the spring members 26, 27 and thus removed, whereupon the ensuing slider S'' is advanced automatically by aggregated gravity of the train of sliders S to the assembling position. This operation is repeated to effect the assembly of sliders S in immediate succession.

Either or both of the side panels 12, 13 may be conveniently made of a transparent material such that the condition of the array of sliders S can be monitored.

Referring to Figure 4, there is shown a modification of the guiding means 19 according to the invention. This modification is characterized by the provision of a plurality of spaced retaining elements 30 on each of the guide rails 24, 25 for preventing the backward movement of the sliders S during the assembly thereof on the fastener chain. Each retaining element 30 is pivotally con-

5 nected at one end of the guide rail 20, 21
as by a pin 31 and normally urged towards
the slider S by a spring 32, the arrangement
being that a series of these space elements
30 are held resiliently in sliding engagement
with the side flanges of the sliders S during
the transport thereof along the guide rails
20, 21, but are held in abutting relation to
10 the slider body to arrest the sliders S while
the leading one of them is being assembled
on the fastener chain F.

15 Having thus described the invention, it is
to be understood that various changes or sub-
stitutions may be made in the specific form
and construction herein described and
illustrated in the accompanying drawings,
without departing from the scope of the
appended claims. As for an example, the
slider S which can be handled by the device
20 of the invention may be of the type having
a single pull tab and may be effectively
transported and assembled without sub-
stantial changes in the principles of this
invention.

25 WHAT WE CLAIM IS:—

1. A device for assembling on a slide
fastener chain sliders of the type including
a pull tab pivotally supported on a lug on
the slider, which device comprises an
30 elongated casing having an opening therein
for accommodating a series of sliders that
are transported by their own gravity when
the device is in use, a guiding means dis-
posed in said opening and guiding the move-
35 ment of said series of sliders, a holding

means integral with said guiding means and
holding a leading one of said sliders in posi-
tion for assembly on the slide fastener chain,
resilient means for releasably holding said
leading slider, and means for arresting and
preventing said series of sliders from moving
backward during the assembling operation.

2. A device according to claim 1, wherein
said holding means has its free end curved
slightly upwardly beyond a horizontal path
45 of the fastener chain.

3. A device according to claim 1 or claim
2, wherein said guiding means consists of
spaced parallel rails extending longitudinally
of said casing and defining therebetween a
guide slit and adapted to fit with the spacing
50 between the slider body and the pivotal end
of the pull tab.

4. A device according to any preceding
claim, wherein said arresting means consists
of a series of spaced ledges provided
internally of said casing and projecting into
said opening to arrest a pull tab during the
assembling operation.

5. A device according to any one of
claims 1 to 3, wherein said arresting means
consists of a series of spaced, pivotal ele-
ments arranged to arrest the slider body
during the assembling operation.

6. A device substantially as herein
described with reference to and as illustrated
65 in the accompanying drawings.

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the slider body to arrest the sliders S while
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and construction herein described and
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without departing from the scope of the
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slider S which can be handled by the device
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posed in said opening and guiding the move-
35 ment of said series of sliders, a holding

means integral with said guiding means and
holding a leading one of said sliders in posi-
tion for assembly on the slide fastener chain,
resilient means for releasably holding said
40 leading slider, and means for arresting and
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claim, wherein said arresting means consists
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55 said opening to arrest a pull tab during the
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