

Description

The present invention relates to an apparatus for automatically manufacturing slide fasteners of a desired length from a continuous slide fastener chain according to the preamble of claim 1.

An apparatus of this type is disclosed in GB-A 2 044 140.

As disclosed in Japanese Patent Publication No. 44-12543 and reillustrated here in Fig. 12 of the accompanying drawings, a known apparatus for manufacturing slide fasteners from a continuous slide fastener chain has a stop unit in which a stop B detects the leading end of a pair of coupled fastener element rows A of a succeeding slide fastener chain being moved by a grip unit C and then renders the grip unit C to be stopped upon such detection.

A primary problem with the known stop unit is that since the leading end of a pair of coupled fastener element rows A of a succeeding slide fastener chain is sensed by the stop B to stop the grip unit C to thereby terminate the movement of the slide fastener chain, the slide fastener chain is apt to be damaged.

Further, with such arrangement, it is difficult not only to speed up the processing of the slide fastener chain but also to select a length of prospective slide fasteners easily without restraint.

The present invention seeks to provide a slide fastener manufacturing apparatus having an improved stop unit with which a slide fastener chain can be stopped without being damaged and with which a length of prospective slide fasteners can be selected easily without restraint.

An apparatus satisfying these requirements is characterized in claim 1.

According to the present invention, since the stopping unit is disposed in the travelling path of the grip unit downstream thereof to stop the grip unit, it is possible to terminate the movement of the slide fastener chain easily without impairing the slide fastener chain. Further, since the stop of the stopping unit is movable to an inoperative position not to stop the grip unit, it is possible to discharge the finished slide fasteners easily in order.

Furthermore, since the stopping unit is adjustably disposed in the travelling path of the grip unit, it is possible to select a desired length of the slide fasteners to be manufactured.

Many other advantages, features and additional objects of the present invention will become manifest to those versed in the art upon making reference to the detailed description and the accompanying sheets of drawings in which a preferred structural embodiment incorporating the principle of the present invention is shown by way of illustrative example.

Figure 1 is a fragmentary side elevational view, partially in cross section, of an apparatus embodying to the present invention;

Figure 2 is an enlarged side elevational view, partially in cross section, of a grip unit and a stop unit of the apparatus;

Figure 3 is a perspective view of Figure 2;

Figure 4 is a plan view of the grip unit of Figures 2 and 3;

Figure 5 is a longitudinal cross-sectional view of Figure 4;

Figure 6 is a transverse cross-sectional view of Figure 4;

Figure 7 is a fragmentary plan view of a pair of initially coupled fastener stringers being progressively uncoupled;

Figure 8 is a view similar to Figure 7, showing the initially uncoupled fastener stringers being progressively coupled;

Figure 9 is a view similar to Figure 4, but showing a modified grip unit;

Figures 10 and 11 are plan views of different slide fasteners manufactured by the apparatus according to the present invention; and

Figure 12 is a fragmentary perspective view of a prior art apparatus.

Figure 1 shows a slide fastener finishing apparatus for automatically manufacturing slide fasteners (Figures 10 and 11) of a desired length from a continuous slide fastener chain F.

The apparatus generally comprises a grip unit 1, a cutter unit 2, a bottom-stop attaching unit 3, a slider holding unit 4, a slider-holding-unit control unit (hereinafter referred to as control unit) 5, a slide-fastener-chain detecting unit 6, and a grip-unit stopping unit (hereinafter referred to as stop unit) 7.

As shown in Figures 1 through 6, the grip unit 1 is slidably mounted on a pair of parallel guide rods 10, 10 extending parallel to a path of the slide fastener chain F and is movable on and along the guide rods 10, 10 in response to the action of an air cylinder (not shown).

The grip unit 1, as best shown in Figures 5 and 6, has at its upstream end a pair of grippers 11, 12 for gripping respective leading ends of a pair of stringers of the slide fastener chain F. The two grippers 11, 12 are attached to a lower side of a support plate 13 via a pair of attachment plates 14, 14 pivotally connected at respective downstream ends to the support plate 13 by a pair of pivots 22, 22, respectively. The support plate 13 is mounted astride the guide rods 10, 10. The two grippers 11, 12 are identical in construction and are symmetrical with respect to a vertical plane extending centrally along the path of the slide fastener chain F. Therefore, following is a detailed description of one of the grippers 11, with the description of the other gripper 12 omitted.

As shown in Figure 3, the gripper 11 includes upper and lower grip members 15, 15 pivotally connected at their intermediate portions to a gripper body 16 and normally urged by a spring 17 so as to normally open at their upstream ends. The upper and lower grip members 15, 15 have at their downstream ends a pair of opposite sloping surfaces 15a, 15a. When a tapered piston rod 18 of an air cylinder 19 mounted in the gripper body 16 is extended to enter between the sloping surfaces 15a, 15a, the upper and lower grip members 15, 15 are closed at their upstream ends against the bias of the spring 17. The piston rod 18 is normally urged by a spring 20 to retract from the

grip members 15, 15 and is projectable between the downstream ends of the upper and lower grip members 15, 15 as air is supplied to the air cylinder 19 via a supply pipe 21.

As shown in Figure 6, the two grippers 11, 12 are laterally spaced from each other by a predetermined distance. A distance retaining plate 23 is adjustably attached to the support plate 13 between the attachment plates 14, 14 by a screw 24 extending through a slot in the distance retaining plate 23. The two gripper bodies 16, 16 have substantially centrally at their bottoms a pair of pins 25, 25, between which an extension spring 26 is mounted to normally urge the upstream ends of the two grippers 11, 12 toward each other.

As shown in Figures 2 through 5, the two grippers 11, 12 have near their upstream ends a pair of guide pins 27, 27 each mounted on the top of the respective gripper 11, 12 via a guide plate 28. The two guide pins 27, 27 are engageable with a pair of cam surfaces 29, 29 at a tapered end of a cam plate 30 disposed parallel to the path of the slide fastener chain F. When the grip unit 1 is moved downstream along the path of the slide fastener chain F, the guide pins 27, 27 roll on the cam surfaces 29, 29 of the cam plate 30, causing the two grippers 11, 12 to pivotally move about the respective pivots 22, 22 so that their upstream ends of the grippers 11, 12 are moved away from each other against the bias of the spring 26, as shown in Figure 4. Thus the two grippers 11, 12 are capable of spreading apart to cope with that the initially coupled stringers of the slide fastener chain F are progressively uncoupled by a slider S as shown in Figure 7.

Although the tapered end of the cam plate 30 is directed upstream of the path of the slide fastener chain F in the embodiment discussed above, the tapered end of the cam plate 30 may be directed downstream of the path of the slide fastener chain F as shown in Figure 9. With this alternative arrangement of the cam plate 30, the upstream ends of the two grippers 11, 12 are movable toward each other when the grip unit 1 is moved downstream of the path of the slide fastener chain F. Thus the two grippers 11, 12 are movable so as to cope with that the initially uncoupled stringers of the slide fastener chain F are progressively coupled by the slider S as shown in Figure 8.

The downstream movement of the grip unit 1 is stopped by the stop unit 7. As shown in Figures 1, 2 and 3, the stop unit 7 includes a slide 31, a stop 32, a proximity detector 33, and an adjusting means 34.

The slide 31 is slidably mounted on the cam plate 30 and is adjustably secured by the adjusting means 34 at a selected position corresponding to a desired length of slide fasteners to be manufactured. The proximity detector 33 is mounted on the upper portion of the slide 31. The stop 32 is disposed at the upstream side of the slide 31 and is supported thereby. When a magnet 50 carried on the downstream end of the grip unit 1 reaches a first proximity switch 33a of the proximity detector 33, the first proximity switch 33a is actuated to produce an electrical signal to deenergize a non-illustrated air cylinder (which is a drive means for the grip unit 1). Thereaf-

ter the grip unit 1 continues moving downstream under the force of inertia and does not perfectly stop until its downstream end strikes the stop 32. A shock absorber 35 is mounted on a distal end of the stop 32 for minimizing the shock of collision. Thus the movement of the slide fastener chain F is terminated.

Upon termination of the movement of the slide fastener chain F, a predetermined slide-fastener length of the slide fastener chain F is cut by the cutter unit 3, and at the same time, a bottom stop T is attached to the slide fastener chain F of the slide-fastener length by the bottom-stop attaching unit 3 which is disposed immediately downstream of the cutter unit 2.

When the cutting of the slide fastener chain F and the attachment of the bottom stop T have thus been completed, the stop 32 is lowered on the slide 31 from the solid-line position to the phantom-line position in Figures 1 and 2 by an air cylinder 37. In this phantom-line position, the stop 32 is inoperative. The grip unit 1 is driven again to further move downstream, pulling the slide fastener chain F of the slide-fastener length to such an extent that its trailing end is moved past the cutter unit 2, the bottom-stop attaching unit 3, and the slider holding unit 4. When the magnet 50 carried on the downstream end of the grip unit 1 reaches a second proximity switch 33b of the proximity detector 33 which switch is spaced a predetermined distance from the first proximity switch 33a downstream thereof, the second proximity switch 33b is actuated to produce an electrical signal to deenergize again the non-illustrated air cylinder as the drive means for the grip unit 1. Thereafter the grip unit 1 continues moving downstream under the force of inertia and does not perfectly stop until its downstream end strikes an upstream surface of the slide 31. Thus the movement of the slide fastener chain F is terminated. Then the two grippers 11, 12 are actuated to open, releasing the slide fastener chain F of the slide-fastener length to fall for discharge. Thus the slide fastener of a desired length has been manufactured.

The adjusting means 34 is mounted on the top of the slide 31 for adjustably fastening the slide 31 to the cam plate 30. The adjusting means 34 may include a threaded member; when unfastened by turning the threaded member 34 in one direction, the slide 31 is allowed to move along the cam plate 30 to a desired position, whereupon the slide 31 is fastened to the cam plate 30 by turning the threaded member 34 in the reverse direction. The upper surface of the cam plate 30 is marked with degrees so that the length of the slide fastener chain F to be cut can be selected simply by setting the slide 30 at a corresponding degree.

As shown in Figure 1, the cutter unit 2 is disposed immediately downstream of the slide-fastener-chain detecting unit 6 and includes a cutter 40 disposed above the path of the slide fastener chain F and co-operative with a die 41 disposed below the path of slide fastener chain F.

The bottom-stop attaching unit 3 is immediately downstream of the cutter unit 2 and includes a form-

ing punch 42, a cutting punch 43, a bender 44, and a die 45 disposed below the path of the slide fastener chain F. A metal strip is supplied to the bender 44 and is cut into a predetermined length by the cutting punch 43. Then the predetermined length of the metal strip is bent by the forming punch 42 to provide a bottom stop T. The forming punch 42 is cooperative with the die 45 to attach the bottom stop T to the slide fastener chain F. This attaching operation takes place concurrently with the cutting operation when the grip unit 1 stops at the first time.

The slider holding unit 4 is disposed immediately downstream of the bottom-stop attaching unit 3 for threading the slider S onto the slide fastener chain F. The slider holding unit 4 includes a slider holder 46 disposed below the path of the slide fastener chain F and composed of a slider retaining lever 47, a retaining-lever moving lever 48, and a clasper 49. When the retaining-lever moving lever 48 is lowered, the slider retaining lever 47 is pivotally moved about a pivot 47a from an upright position (indicated by solid lines) and a substantially horizontal position (indicated by phantom lines in Figure 1), whereupon a slider S is supplied to the top of the slider holder 46 via a slider chute (not shown). Then the retaining-lever moving lever 48 is raised to return the slider retaining lever 47 to the original upright position. In this upright position, the slider retaining lever 47 is cooperative with the clasper 49 to hold a pull tab of the slider S. The slider holder 46 with the slider S thus retained thereon is moved upwardly until the slider S reaches the path of the slide fastener chain F where the slide fastener chain F is threaded through the slider S. A slider detecting unit 51 is disposed above the path of the slide fastener chain F in vertical alignment with the slider holder 46 for contacting the slider S on the slider holder 46 to thereby detect the presence of a slider S. In the absence of a slider S on the slider holder 46, a switch 52 carried on the slider detecting unit 51 is actuated to produce an electrical signal terminating the operation of the apparatus.

The control unit 5 is operative to control the time when the slider holding unit 4 should release the slider S. The control unit 5 includes a limit switch adjustably mounted on a rod parallel to the guide rods 10. This limit switch is set at a selected position on the rod; when the grip unit 1 reaches such a selected position, the limit switch is energized to produce an electrical signal to the slider holding unit 4. Upon receipt of the electrical signal, the slider retaining lever 47 is pivotally moved to release the slider S, thus allowing the slider S to be conveyed together with the slide fastener chain F. Thus by varying the position of the limit switch on the rod, it is possible to make various kinds of slide fasteners each carrying the slider S at a different position, as shown in Figures 10 and 11.

Claims

1. An apparatus for automatically manufacturing a slide fastener of a predetermined length from a slide fastener chain (F) of a continuous length, comprising: a horizontally reciprocable grip unit (1) for

gripping a leading end of the slide fastener chain (F) and for moving the slide fastener chain (F) along a longitudinal path; a gripunit stopping unit (7) adjustably disposed in the path of the slide fastener chain (F); a cutter unit (2) disposed in the path of the slide fastener chain (F) remotely upstream of said stopping unit (7) for cutting the slide fastener chain (F) into a selected slide-fastener length when said grip unit (1) is stopped by said stop (32); a bottom stop attaching unit (3) disposed immediately downstream of said cutter unit (2) for attaching a bottom stop (T) to the slide fastener chain (F) of the selected slide fastener length; and a slider holding unit (4) disposed immediately downstream of said bottom-stop unit (3) for holding a slider (S) in the path of the slide fastener chain (F) to thread the slider (S) onto the slide fastener chain (F) as the latter is moved downstream by said grip unit (1); characterized in that said stopping unit (7) is disposed downstream of said grip unit (1), and that said stopping unit (7) has a stop (32) movable between an operative position in which said stop (32) is engageable with a downstream end of said grip unit (1) to stop the latter, and an inoperative position in which said stop (32) is not engageable with the downstream end of said grip unit (1) to allow the latter to continue moving.

2. An apparatus according to claim 1, wherein said stopping unit (7) further includes a slide (31) slidably mounted on a supporting means (30) extending parallel to the path of the slide fastener chain, and an adjusting means (34) for adjustably securing said slide (31) to said supporting means (30) at a selected position corresponding to the selected slide-fastener length of the slide fastener chain (F) to be cut, said stop (32) being supported on said slide (31) at an upstream side thereof.

3. An apparatus according to claim 2, wherein said stopping unit (7) further includes an air cylinder (37) supported on said slide (31) and having a piston rod, said stop (32) being connected to said piston rod and being movable vertically between said operative and inoperative positions in response to movement of said piston rod.

4. An apparatus according to claim 3, wherein said stopping unit (7) further includes a proximity detector (33) supported on said slide (31) and composed of first and second proximity switches (33a), (33b) spaced a predetermined distance from each other, said grip unit (1) having a magnet (50) carried on a downstream end thereof, said first proximity switch (33a) being actuated, when said magnet (50) on said grip unit (1) reaches said first proximity switch (33a), to produce an electrical signal for deenergizing a drive for said grip unit (1) so that said grip unit (1) continues moving downstream under the force of inertia until it strikes a distal end of said stop (32) in said operative position, said grip unit (1) being movable downstream when said grip unit (1) is redriven by said drive and when said stop (32) is moved to said inoperative position, said second proximity switch (33b) being actuated, when said magnet (50) on said grip unit (1) reaches said second proximity switch (33b), to produce an electrical signal for deenergizing said drive for said grip unit (1) so that said grip unit (1) continues moving down-



ing punch 42, a cutting punch 43, a bender 44, and a die 45 disposed below the path of the slide fastener chain F. A metal strip is supplied to the bender 44 and is cut into a predetermined length by the cutting punch 43. Then the predetermined length of the metal strip is bent by the forming punch 42 to provide a bottom stop T. The forming punch 42 is cooperative with the die 45 to attach the bottom stop T to the slide fastener chain F. This attaching operation takes place concurrently with the cutting operation when the grip unit 1 stops at the first time.

The slider holding unit 4 is disposed immediately downstream of the bottom-stop attaching unit 3 for threading the slider S onto the slide fastener chain F. The slider holding unit 4 includes a slider holder 46 disposed below the path of the slide fastener chain F and composed of a slider retaining lever 47, a retaining-lever moving lever 48, and a clasper 49. When the retaining-lever moving lever 48 is lowered, the slider retaining lever 47 is pivotally moved about a pivot 47a from an upright position (indicated by solid lines) and a substantially horizontal position (indicated by phantom lines in Figure 1), whereupon a slider S is supplied to the top of the slider holder 46 via a slider chute (not shown). Then the retaining-lever moving lever 48 is raised to return the slider retaining lever 47 to the original upright position. In this upright position, the slider retaining lever 47 is cooperative with the clasper 49 to hold a pull tab of the slider S. The slider holder 46 with the slider S thus retained thereon is moved upwardly until the slider S reaches the path of the slide fastener chain F where the slide fastener chain F is threaded through the slider S. A slider detecting unit 51 is disposed above the path of the slide fastener chain F in vertical alignment with the slider holder 46 for contacting the slider S on the slider holder 46 to thereby detect the presence of a slider S. In the absence of a slider S on the slider holder 46, a switch 52 carried on the slider detecting unit 51 is actuated to produce an electrical signal terminating the operation of the apparatus.

The control unit 5 is operative to control the time when the slider holding unit 4 should release the slider S. The control unit 5 includes a limit switch adjustably mounted on a rod parallel to the guide rods 10. This limit switch is set at a selected position on the rod; when the grip unit 1 reaches such a selected position, the limit switch is energized to produce an electrical signal to the slider holding unit 4. Upon receipt of the electrical signal, the slider retaining lever 47 is pivotally moved to release the slider S, thus allowing the slider S to be conveyed together with the slide fastener chain F. Thus by varying the position of the limit switch on the rod, it is possible to make various kinds of slide fasteners each carrying the slider S at a different position, as shown in Figures 10 and 11.

Claims

1. An apparatus for automatically manufacturing a slide fastener of a predetermined length from a slide fastener chain (F) of a continuous length, comprising: a horizontally reciprocable grip unit (1) for

gripping a leading end of the slide fastener chain (F) and for moving the slide fastener chain (F) along a longitudinal path; a gripunit stopping unit (7) adjustably disposed in the path of the slide fastener chain (F); a cutter unit (2) disposed in the path of the slide fastener chain (F) remotely upstream of said stopping unit (7) for cutting the slide fastener chain (F) into a selected slide-fastener length when said grip unit (1) is stopped by said stop (32); a bottom stop attaching unit (3) disposed immediately downstream of said cutter unit (2) for attaching a bottom stop (T) to the slide fastener chain (F) of the selected slide fastener length; and a slider holding unit (4) disposed immediately downstream of said bottom-stop unit (3) for holding a slider (S) in the path of the slide fastener chain (F) to thread the slider (S) onto the slide fastener chain (F) as the latter is moved downstream by said grip unit (1); characterized in that said stopping unit (7) is disposed downstream of said grip unit (1), and that said stopping unit (7) has a stop (32) movable between an operative position in which said stop (32) is engageable with a downstream end of said grip unit (1) to stop the latter, and an inoperative position in which said stop (32) is not engageable with the downstream end of said grip unit (1) to allow the latter to continue moving.

2. An apparatus according to claim 1, wherein said stopping unit (7) further includes a slide (31) slidably mounted on a supporting means (30) extending parallel to the path of the slide fastener chain, and an adjusting means (34) for adjustably securing said slide (31) to said supporting means (30) at a selected position corresponding to the selected slide-fastener length of the slide fastener chain (F) to be cut, said stop (32) being supported on said slide (31) at an upstream side thereof.

3. An apparatus according to claim 2, wherein said stopping unit (7) further includes an air cylinder (37) supported on said slide (31) and having a piston rod, said stop (32) being connected to said piston rod and being movable vertically between said operative and inoperative positions in response to movement of said piston rod.

4. An apparatus according to claim 3, wherein said stopping unit (7) further includes a proximity detector (33) supported on said slide (31) and composed of first and second proximity switches (33a), (33b) spaced a predetermined distance from each other, said grip unit (1) having a magnet (50) carried on a downstream end thereof, said first proximity switch (33a) being actuated, when said magnet (50) on said grip unit (1) reaches said first proximity switch (33a), to produce an electrical signal for deenergizing a drive for said grip unit (1) so that said grip unit (1) continues moving downstream under the force of inertia until it strikes a distal end of said stop (32) in said operative position, said grip unit (1) being movable downstream when said grip unit (1) is redriven by said drive and when said stop (32) is moved to said inoperative position, said second proximity switch (33b) being actuated, when said magnet (50) on said grip unit (1) reaches said second proximity switch (33b), to produce an electrical signal for deenergizing said drive for said grip unit (1) so that said grip unit (1) continues moving down-



stream under the force of inertia until it strikes said slide (31).

5. An apparatus according to claim 4, wherein said stop (32) has a shock absorber (35) mounted on the distal end thereof for minimizing the shock of collision.

Patentansprüche

1. Vorrichtung zum automatischen Herstellen eines Reißverschlusses bestimmter Länge aus einer endlosen Reißverschlußkette (F), umfassend: eine horizontal hin- und herbewegbare Greifereinheit (1) zum Erfassen eines vordem Endes der Reißverschlußkette (F) und zum Bewegen der Reißverschlußkette (F) entlang einer längsgerichteten Bahn; eine Greifereinheit-Stoppeinheit (7), die in der Bahn der Reißverschlußkette (F) einstellbar angeordnet ist; eine Schneideinheit (2), die im Abstand stromaufwärts von der Stoppeinheit (7) in der Bahn der Reißverschlußkette (F) angeordnet ist, um von der Reißverschlußkette (F) einen Reißverschluß gewünschter Länge abzuschneiden, wenn die Greifereinheit (1) durch den Anschlag (32) angehalten wird; eine Begrenzungsteil-Befestigungseinheit (3), die unmittelbar stromabwärts von der Schneideinheit (2) angeordnet ist, um ein unteres Begrenzungsteil (T) an der Reißverschlußkette (F) des Reißverschlusses der gewünschten Länge zu befestigen; und eine Schieberhalteeinheit (4), die unmittelbar stromabwärts von der Begrenzungsteil-Befestigungseinheit (3) angeordnet ist, um einen Schieber (S) in der Bahn der Reißverschlußkette (F) zu halten, zum Aufziehen des Schiebers (S) auf die Reißverschlußkette (F), während diese durch die Greifereinheit (1) stromabwärts bewegt wird; dadurch gekennzeichnet, daß die Stoppeinheit (7) stromabwärts von der Greifereinheit (1) angeordnet ist und daß die Stoppeinheit (7) einen Anschlag (32) hat, der zwischen einer wirksamen Stellung, in der dieser Anschlag (32) mit einem stromabwärtigen Ende der Greifereinheit (1) in Eingriff bringbar ist, um diese zu stoppen, und einer unwirksamen Stellung bewegbar ist, in der dieser Anschlag (32) mit dem stromabwärtigen Ende der Greifereinheit (1) nicht in Eingriff bringbar ist, damit diese ihre Bewegung fortsetzen kann.

2. Vorrichtung nach Anspruch 1, wobei die Stoppeinheit (7) ferner einen Schlitten (31) umfaßt, der in einem sich zu der Bahn der Reißverschlußkette parallel erstreckenden Support (30) verschiebbar gelagert ist, und Einstellmittel (34) umfaßt, um den Schlitten (31) in einer ausgewählten Stellung am Support (30) festzulegen, die der gewünschten Reißverschlußlänge der abzuschneidenden Reißverschlußkette (F) entspricht, wobei der Anschlag (32) an einer stromaufwärtigen Seite des Schlittens (31) abgestützt ist.

3. Vorrichtung nach Anspruch 2, wobei die Stoppeinheit (7) ferner einen von dem Schlitten (31) abgestützten Pneumatikzylinder (37) umfaßt, der eine Kolbenstange hat, wobei der Anschlag (32) mit dieser Kolbenstange verbunden und entsprechend der Bewegung der Kolbenstange zwischen der er-

wähnten wirksamen und unwirksamen Stellung bewegbar ist.

4. Vorrichtung nach Anspruch 3, wobei die Stoppeinheit (7) ferner einen Annäherungsdetektor (33) umfaßt, der auf dem Schlitten (31) angeordnet ist und erste und zweite Annäherungsschalter (33a, 33b) aufweist, die in einem bestimmten Abstand voneinander angeordnet sind, wobei die Greifereinheit (1) am stromabwärtigen Ende einen Magnet (50) trägt, wobei der erste Annäherungsschalter (33a) betätigt wird, wenn der Magnet (50) an der Greifereinheit den ersten Annäherungsschalter (33a) erreicht, um ein elektrisches Signal zum Anhalten eines Antriebs der Greifereinheit (1) zu erzeugen, so daß die Greifereinheit (1) unter der Trägheitskraft fortfährt, sich stromabwärts zu bewegen, bis sie auf ein abliegendes Ende des in seiner wirksamen Stellung befindlichen Anschlags (32) auftrifft, wobei die Greifereinheit (1) stromabwärts bewegbar ist, wenn sie von dem besagten Antrieb erneut angetrieben wird und wenn der Anschlag (32) in die unwirksame Stellung bewegt wird, wobei der zweite Annäherungsschalter (33b) betätigt wird, wenn der besagte Magnet an der Greifereinheit (1) den zweiten Annäherungsschalter (33b) erreicht, um ein elektrisches Signal zum Abschalten des Antriebs der Greifereinheit (1) zu erzeugen, so daß die Greifereinheit (1) unter der Trägheitskraft fortfährt, sich stromabwärts zu bewegen, bis sie auf dem Schlitten (31) auftrifft.

5. Vorrichtung nach Anspruch 4, wobei an dem abliegenden Ende des Anschlags (32) ein Stoßdämpfer (35) angeordnet ist, um den Aufprall zu verringern.

Revendications

1. Appareil destiné à la fabrication automatique d'une fermeture à glissière de longueur prédéterminée, à partir d'une chaîne continue (F) de fermeture à glissière, comprenant: une unité de saisie (1) susceptible d'être déplacée horizontalement en va-et-vient, destinée à saisir l'extrémité avant de la chaîne (F) de fermeture à glissière et à déplacer la chaîne (F) de fermeture à glissière le long d'un trajet longitudinal; une unité d'arrêt (7) de l'unité de saisie disposée de façon réglable sur le trajet de la chaîne (F) de fermeture à glissière; une unité de coupe (2) disposée sur le trajet de la chaîne (F) de fermeture à glissière à l'écart en amont de ladite unité (7) d'arrêt, destinée à couper la chaîne (F) de fermeture à glissière pour former une longueur choisie de fermeture à glissière lorsque ladite unité de saisie (1) est arrêtée par ledit élément d'arrêt (32); une unité (3) de fixation de butée inférieure, disposée immédiatement en aval de ladite unité de coupe (2), destinée à fixer une butée inférieure (T) à ladite chaîne (F) de fermeture à glissière de la longueur de fermeture à glissière choisie; et une unité (4) de maintien de curseur disposée immédiatement en aval de ladite unité (3) de butée inférieure destinée à maintenir un curseur (S) dans le trajet de la chaîne (F) de fermeture à glissière en vue d'enfiler le curseur (S) sur la chaîne (F) de fermeture à glissière lorsque cette dernière est déplacée



en direction de l'aval par ladite unité de saisie (1); caractérisé en ce que ladite unité d'arrêt (7) est disposée en aval de ladite unité de saisie (1) et que ladite unité d'arrêt (7) comporte un élément d'arrêt (32) mobile entre une position de fonctionnement dans laquelle ledit élément d'arrêt (32) peut se mettre en prise avec une extrémité aval de ladite unité de saisie (1) afin d'arrêter cette dernière, et une position de non-fonctionnement dans laquelle ledit élément d'arrêt (32) ne peut pas se mettre en prise avec l'extrémité aval de ladite unité de saisie (1) afin de permettre à cette dernière de continuer à se déplacer.

2. Appareil selon la revendication 1, dans lequel ladite unité d'arrêt (7) comprend un coulisseau (31) monté de façon coulissante sur un moyen de support (30) qui s'étend parallèlement au trajet de la chaîne de fermeture à glissière, et un moyen de réglage (34) destiné à fixer de façon réglable ledit coulisseau (31) audit moyen de support (30) à un emplacement choisi correspondant à la longueur de fermeture à glissière choisie qui doit être coupée dans la chaîne (F) de fermeture à glissière, ledit élément d'arrêt (32) étant porté par ledit coulisseau (31) d'un côté de celui-ci situé en amont.

3. Appareil selon la revendication 2, dans lequel ladite unité d'arrêt (7) comprend en outre un vérin pneumatique (37) porté par ledit coulisseau (31) et comportant une tige de piston, ledit élément d'arrêt (32) étant relié à ladite tige de piston et étant mobile verticalement entre ladite position de fonctionnement et ladite position de non-fonctionnement en réaction au déplacement de ladite tige de piston.

4. Appareil selon la revendication 3, dans lequel ladite unité d'arrêt (7) comprend un détecteur (33) de proximité porté par ledit coulisseau (31) et composé d'un premier et d'un second contacts de proximité (33a), (33b) espacés l'un de l'autre d'une distance prédéterminée, ladite unité de saisie (1) comportant un aimant (50) qu'elle porte à son extrémité aval, ledit premier contact de proximité (33a) étant actionné lorsque ledit aimant (50) fixé sur ladite unité de saisie (1) atteint ledit premier contact de proximité (33a), afin de produire un signal électrique en vue de faire cesser l'alimentation en énergie d'un dispositif d'entraînement de ladite unité de saisie (1), de façon telle que ladite unité de saisie (1) continue à se déplacer vers l'aval sous l'effet de la force d'inertie jusqu'à ce qu'elle heurte une extrémité distale dudit élément d'arrêt (32) dans ladite position de fonctionnement, ladite unité de saisie (1) pouvant se déplacer vers l'aval lorsque ladite unité de saisie (1) est entraînée à nouveau par ledit dispositif d'entraînement, et lorsque ledit élément d'arrêt (32) est déplacé jusque dans ladite position de nonfonctionnement, ledit second contact de proximité (33b) étant actionné lorsque ledit aimant (50) fixé sur ladite unité de saisie (1) atteint ledit second contact de proximité (33b), afin de produire un signal électrique en vue de faire cesser l'alimentation en énergie dudit dispositif d'entraînement de ladite unité de saisie (1), de façon telle que ladite unité de saisie (1) continue à se déplacer vers l'aval sous l'effet de la force d'inertie jusqu'à ce qu'elle heurte ledit coulisseau (31).

5. Appareil selon la revendication 4, dans lequel ledit élément d'arrêt (32) comporte un amortisseur (35) monté sur son extrémité distale dans le but de réduire à un minimum le choc de la collision.

5

10

15

20

25

30

35

40

45

50

55

60

65