APPLICATION FOR A PATENT
(Combined Form — Convention and Non-Convention)

We, SCOVILL INC., a corporation organized under the laws of the State of Connecticut, one of the United States of America, of 500 Chase Parkway, City of Waterbury, State of Connecticut, United States of America, hereby apply for the grant of a Patent for an invention entitled "APPARATUS FOR ATTACHING SLIDE FASTENER ELEMENTS TO FABRIC," which is described in the accompanying Provisional Complete Specification.

2. This application is a Convention Application and is based on the application(s) for a patent or similar protection made in the United States of America on May 29, 1979, numbered 043,443, and on , numbered , and on numbered .

3. My/Our address for service is: COLLISON & CO., Savings Bank Building, 97 King William Street, Adelaide, South Australia, 5000.

DATED this 7th day of May, 1980.

[Signature]
S. S. HUDNUT
Vice President

[Stamp: COMMONWEALTH OF AUSTRALIA]

To the Commissioner of Patents,

To be signed by the applicant(s) or in the case of a Company, to be signed by a person authorised by the Company

(a) "Apparatus for attaching slide fastener elements to fabric"

(b) S.S. Hudnut (Vice President)

(c) 500 Chase Parkway,
Waterbury, Connecticut
United States of America

We, the applicant(s) or in the case of a Company, to be signed by a person authorised by the Company, do solemnly and sincerely declare as follows:

1. I am/we are the applicant(s) for the patent or patent of addition.

2. The basic application(s) as defined by Section 141 of the Act was/were made in the following country(ies) on the following date(s) namely:

   - in [country], on [date], No. [application number]

   - in [country], on [date], No. [application number]

3. I am/we are the actual inventor(s) of the invention referred to in the basic application.

4. The basic application(s) referred to in paragraph 2 of this Declaration was/were the first application(s) made in a Convention country in respect of the invention the subject of the application. The said SCOVILL INC., is the assignee of the said invention.

Waterbury, Connecticut, this 7th day of May, 1980.

S.S. Hudnut, Vice President

(The Commissioner of Patents, Commonwealth of Australia)
Attaching slide fastener elements

Scovill Inc.

Gauthier, H.J.

Claim

1. Apparatus for use in attaching slide fastener elements directly to the fabric of a garment or the like, of the type including an indexing blade engagable between adjacent fastener elements of a line of fastener elements, a driven linkage including a base plate driven by the sewing machine for moving the blade in a repetitive path to engage the line from above and to index the fastener elements in a step-by-step fashion past a reciprocating needle of the sewing machine, and a selectively actuable mechanism for severing cords interconnecting the line of fastener elements on completion of the sewing of a selected number of fastener elements to the fabric, characterized in that a direct drive is provided from the sewing machine to the driven linkage for operating the driven linkage in timed relation with reciprocation of the needle of the sewing machine, said indexing blade is yieldably mounted on the base plate, and a cutter blade is rigidly mounted on the base plate adjacent the indexing blade, whereby upon actuation of the selectively actutable mechanism, the base plate lowers below its normal lower limit and the indexing blade yields permitting the cutter blade to sever the cords.
Name of Applicant: SCOVILL INC.

Address of Applicant: 500 Chase Parkway, City of Waterbury, State of Connecticut, United States of America

Actual Inventor: HENRY JOSEPH GAUTHIER

Address for Service: COLLISON & CO., Savings Bank Building, 97 King William Street, Adelaide, South Australia, 5000.

Complete Specification for the invention entitled:

"APPARATUS FOR ATTACHING SLIDE FASTENER ELEMENTS TO FABRIC"

The following statement is a full description of this invention, including the best method of performing it known to us.
This invention relates to an apparatus for feeding a ladder of slide fastener elements past the needle of a sewing machine in timed sequence with a reciprocating needle of the sewing machine to permit the direct attachment of the slide fastener elements to the fabric of a garment.

In particular, the invention relates to apparatus of the type including a reciprocable blade which is engagable between adjacent fastener elements of a line of such fastener elements constituting the ladder and a linkage driven by the sewing machine for reciprocating the blade in a continuous path to index the fastener elements through the sewing machine simultaneously with and in timed sequence with reciprocation of the needle.

In a prior apparatus of this type it has been proposed that the reciprocable indexing blade also perform the function of a cutter, which can be selectively actuated to sever connecting cords of the ladder of fastener elements on the completion of the sewing of a selected number of elements to the fabric.

While not limited thereto, the invention of the present application finds particular application in the sewing to fabric of a slide fastener of the type disclosed in U.S. Patent 3,414,948, that slide fastener comprising two ladders of interfitting fastener elements of generally U-shaped configuration, which are held in uniform spaced relation by a pair of connecting cords buried respectively in the ends of the two legs.

It is an object of the present invention to provide an improved apparatus of the type referred to above, which is extremely positive, accurate, and reliable in operation, and
which is capable of operation at extremely high speeds over protracted periods of time without the requirement for adjustment.

According to the present invention, there is provided an apparatus of the type referred to above in which a direct drive is provided from the sewing machine to a driven linkage for operating the driven linkage in timed relation with reciprocation of the needle of the sewing machine. The indexing blade is yieldably mounted on the base plate, and a cutter blade is rigidly mounted on the base plate adjacent the indexing blade, whereby upon actuation of the resiliently actutable mechanism the base plate lowers below its normal lower limit and the indexing blade yields permitting the cutter blade to sever the cords. Preferably, the driven linkage and a base plate associated therewith is supported solely by the body of the sewing machine and, in running operation, is independent of and isolated from movements of the reciprocating needle or of the presser foot of the sewing machine.

The support of the apparatus of the present invention directly on the body of the sewing machine has the effect of totally isolating the driven linkage and the reciprocable blades from vibration arising from the vagaries of dynamic and kinetic interaction of the reciprocating needle bar and the reciprocating movement of the presser foot under the influence of the fabric feed mechanism of the sewing machine. This increases the accuracy with which the indexing blade enters between the adjacent fastener elements, even at exceptionally high speeds, and further effectively eliminates the possibility of inadvertent overshooting of either of the indexing blade or the cutter blade under the influence of said vibration, such as could cause bruising, abrasion or nicking of the cords of the ladder of fastener elements. Further, by virtue of the provision of separate indexing and cutting blades and the yieldable support of the indexing blade, the possibility of inadvertent nicking of the cords of the ladder is eliminated in its entirety.
The invention will now be described with reference to the accompanying drawings, in which:

Fig. A is an enlarged view transverse of a line of fastener elements with which the invention is adapted to be used;

Fig. 1 is a perspective view of an apparatus embodying the invention attached to a conventional sewing machine;

Fig. 2 is a sectional view taken on the line 2-2 of Fig. 1;

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

Fig. 4 is a rear view of the apparatus with a cylinder and an upper part of an end plate of the apparatus broken away to save drawing space;

Fig. 5 is a greatly enlarged front view of the sewing station of the machine;

Fig. 6 is a sectional view taken on the line 6-6 of Fig. 5;

Fig. 7 is a greatly enlarged sectional view taken on the line 7-7 of Fig. 15;

Fig. 8 is an enlarged fragmentary sectional view taken on the line 8-8 of Fig. 4 with a portion of a feed and cutter assembly and a presser foot shown broken away to show interior construction;

Fig. 8a is a front view of Fig. 8 showing feed and cutter blades of the feed and cutter assembly elevated above the fastener elements;

Fig. 9 is a view similar to Fig. 8 but showing the feed and cutter assembly with its front end downward to engage fastener elements in the line;

Fig. 9a is a view similar to Fig. 8a but showing the feed blade engaging the line of fastener elements. The left portion of the feed blade is shown broken away to show the cutting blade;

Fig. 10 is comparable to Figs. 8 and 9 but shows the feed and cutting assembly drawn rearward to the end of its
stroke and a depressor bar pushing the front end of the feed and cutter assembly downward for the cutter blade to sever the connecting cords of the line of fastener elements;

Fig. 10a is comparable to Fig. 9a but shows the cutter blade actually cutting the connecting cords;

Fig. 11 is a greatly enlarged view of the encircled portion of Fig. 9 showing the feed blade engaged between adjacent fastener elements in a line of fastener elements;

Fig. 12 is an enlarged sectional view taken on the line 12-12 of Fig. 2;

Fig. 13 is a greatly enlarged fragmentary sectional view taken on the line 13-13 of Fig. 2;

Fig. 14 is an enlarged fragmentary sectional view taken on the line 14-14 of Fig. 2;

Fig. 15 is an enlarged sectional view taken on the line 15-15 of Fig. 2;

Fig. 16 is a sectional view taken on the line 16-16 of Fig. 2;

Fig. 17 is an enlarged fragmentary exploded view in perspective of the front end of the feed and cutter assembly;

Fig. 18 is a sectional view taken on the line 18-18 of Fig. 6; and

Fig. 19 is a perspective view of the sewing foot with the feed and cutter assembly and mounting block removed.

To assist in understanding the apparatus of the invention, the structure of the fastener elements with which the apparatus of the invention is useful will first be explained. The slide fastener involved comprises two ladders or lines of interfitting fastener elements, a representative element of which is designated generally E in Fig. A. It comprises legs L joined by a central bight B having an enlarged head H. The outer portions of the legs are formed with notches N for reasons which will appear. The individual elements are held in uniform spaced relation by a pair of connecting cords C buried respectively in the ends of the legs.
An apparatus embodying the invention is generally designated 10 in Fig. 1, and is shown attached to a conventional industrial sewing machine 12 having needles 14 at the lower end of needle bars (not shown). A bed or support platform 18 is provided, under which are disposed the conventional mechanism including the bobbin assembly and means to interconnect the bobbin and main threads and feed the fabric as the sewing progresses.

A special foot 20 is provided which holds down the fabric F being worked on against the bed or platform 18. Strip feed tubes 21 supported by means not shown deliver strips to the foot.

An end plate 22 of the apparatus of the present invention replaces the conventional end plate of the sewing machine 12 and is secured as by bolts to the frame of the sewing machine. The end plate 22 has an upward projection 22a. An end of a drive shaft 24 is journaled in the plate for rotation. The shaft 24 is driven by the motor of the sewing machine so that its rotation is in timed relation to the reciprocation of the needles 14. The foot 20 is mounted on the lower end of a foot shaft 26 (Fig. 3), which is urged downwardly by an adjustable spring 27 and held for vertical reciprocation within the bearing 29 in conventional fashion. It is operated by the sewing machine upon actuation of controls, not shown. It is shown in the down position in Fig. 2 but may rise on actuation to permit passage of the fabric without interference.

Referring more specifically to the foot 20, it comprises a mounting block 28 of inverted "T" shape (Fig. 5). The block 28 is vertically apertured to receive the bottom of the foot shaft 26 and a set screw 30 is provided to hold the two in proper relation. Secured by bolts to the opposite side of the outward flanges 32 of the block 28 is the
inverted channel block 34 which supports bottom plates 36, 37, 38. This structure provides an opening 39 which permits the passage of the head of a feed and cutter assembly 40 (Fig. 7).

As shown in Figs. 1, 18 and 19, the sides of the forward end of the channel element 34 are formed with tapered forward wings 34a and 34b. These wings help support the outer bottom plates or runners 36 and 38 (Figs. 5, 6 and 7). A central bottom plate 37 as well as the outer plates are secured by bolts as shown to the inverted channel block 34. The central portion 35 (Figs. 18 and 19) of the inverted channel block 34 extends forward, is raised as at 35a and is stepped downward to present a notch 42 (Fig. 6) running transverse thereof.

As best shown in Figs. 6 and 19, the side bottom plates 36 and 38 are spaced from the central bottom plate 37 to provide channels 44 and 46, respectively. As shown, the inverted channel block 34 (Fig. 7) is notched out at 48 and 50 in line with the channels 44 and 46 for clearance purposes. The channels 44 and 46 are each defined by a pair of offset flanges 52a and 52b and 54a and 54b, respectively, which engage in notches N (Fig. A) of the individual slide fastener element to help support them as they travel through the foot 20.

The lines of fasteners are additionally supported by a wire guide 60 (Figs. 5, 6) which is of generally "U" shape, having a central bight 60a with a bend 60b engaged by the head of a bolt 62 to hold it in the notch 42 on the channel block. The guide at the end of the bight turns downward as at 60c into the channels 44 and 46 and terminates in rearward runs 60d which are disposed between the flanges 52a and 52b, and 54a and 54b, respectively.
As the lines of slide fastener elements move through the foot 20, the wire guide 60 serves to assure that the "U"-shaped elements are sufficiently spread and properly angled as they approach the sewing station (see X in Fig. 6). The rear ends of the run 60d provide a kind of ratchet effect to avoid any forward movement of the lines of fastener elements as the feed and cutter assembly moves forward.

Referring more specifically to the feed and cutter assembly 40, its forward end includes a base plate 70 supported above the bottom of the central section or web of the inverted channel block. To the rear end of the base plate 70 are secured a pair of vertically disposed side plates 72 (Fig. 8) held in spaced relation by a spacer element 74. The forward ends of the side plates 72 are tapered, as shown in Fig. 8, where they are integral with the base plate 70. A spring strip 76 overlies the base plate 70 and has its rearward end secured thereto by a bolt 78 (Fig. 7). Its forward end extends beyond the end of the plate 70.

The front end of plate 70 is provided with a pair of spaced pins 80, 82 (Figs. 6, 17) which extend forwardly as shown. The pins are received into ample openings 84 in a flat inverted "U"-shaped cutter blade 86 having a downward "V"-shaped cutter 88 on either end thereof. Note central aperture 90. A feed or indexing blade 92 is similarly flat and inverted "U"-shaped and is formed with a pair of downward-facing notches 94, the feed blade being thinned at both of its lower ends at 96 and shaped at the downward ends with cut-outs 98, each cut-out having a central tongue 100. Note central aperture 102.

A clamp plate 110, also of inverted "U" shape, is provided with central opening 111 and apertures 112 (Fig. 17) which receive the ends of the pins 80, 82 after they pass through the openings 84, 94 in the cutter and feed blades. The plate
110 has a rearward spacer 113 about opening 111. A bolt 114 extends through central openings 111, 102, and 90 and fits into a tapped opening 116 in the base plate 70 to hold the assembly together. Spacer 113 extends through the aperture 102 in the feed blade 92 and tightly engages cutter blade 86 (Fig. 18). The spacer 113 is thicker than feed blade 92, and thus permits feed blade 92 to move vertically with respect to the spacer.

As best shown in Fig. 5, the feed blade 92 is urged downwardly by the spring 76, and is normally positioned with the upper ends of the notches 94 abutting against the pins 80, 82. The spring strip 76 yields upon upward force on the feed blade 92 to permit the feed blade, after bottoming on surface 35a (Fig. 10), to move upwardly with respect to the pins 80, 82. Cutter blade 86, as explained, is held rigidly with respect to the base plate 70.

As disclosed, the feed and cutter assembly 40 comprises the two elongate side plates 72 spaced by the spacing element 74. A pin 120 extends between the side plates 72 and is journaled in a collar 122 having a central opening and flat sides. A support arm 124 (Fig. 8) is pivoted to the sewing machine end plate 22 by a pin 126 passing through a boss intermediate the ends of the arm 124. The lower end of the arm 124 is formed with an elongated slot 127 which receives the collar 122. A spring 128 presses the collar 122 downward. The lower end of the slot 127 is formed with inward fingers 127a which provide stop means for the lower end of travel of the collar 122 in the slot 127.

The feed and cutter assembly 40 is thus supported, floating fashion, on the arm 124, the collar 122 being permitted substantial vertical sliding movement in the slot 127. The upper end of the arm 124 supports a follower wheel 130 rotatably mounted on a pin 132 carried by the arm 124. As shown
in Fig. 13, the wheel 130 is spaced outwardly from plate 22.

The rearward end of the feed and cutter assembly 40 is provided with a pin 140 which extends between the spaced side plates 72. Intermediate these plates, the pin is received into an opening in a link 142, the upper end of which is pivotally attached by a pin 144 to a kind of walking beam 146 pivotally attached to the plate 22 by a bolt 148 rigidly mounted thereon. The other end of the beam carries a second follower wheel 150.

As disclosed, the shaft 24 rotates in a bearing mounted in the end plate 22. Inward of the plate, the shaft 24 (Fig. 13) has rigidly mounted thereon a first eccentric cam 160 which continuously engages the follower wheel 150 and as the shaft 24 rotates, causes the follower wheel 150 to move up and down. This in turn causes and oscillating movement of the walking beam 146, the motion of the rear end of which is communicated by the link 142 to the rearward end of the feed and cutter assembly 40. As the said rearward end moves up and down, the forward end carrying the feed and cutter blades moves down and up correspondingly (Fig. 8).

Inwardly of the cam 160, the shaft 24 loosely mounts an override cam 170 (Fig. 13) which is formed with a nose 170a. The cam has an integral rearwardly extending arm 172 by which the override cam 170 can be rotated even while the shaft 24 itself is rotating. Further inward from the override cam 170, the shaft 24 rigidly mounts a second eccentric cam 180. This cam engages the follower wheel 130 (Fig. 13) and moves it forward and rearward (Fig. 2) which motion is reflected in a corresponding rearward and forward motion of the lower end of the arm 124. This motion produces corresponding movements of the feed and cutter assembly 40. Still further inward, the shaft 24 is supported by a bearing plate 186 which helps steady the shaft in its rotation. Inward of the bearing plate 186, the shaft 24 is driven by means not shown.
In operation, the continuous rotation of the shaft 24 results in a movement of the forward end of the feed and cutter assembly 40 which generally follows a square or rectangular path proceeding in a counterclockwise sense in the Fig. 2 view. It will, incidentally, be noted that the upper portion of the arm 124 is biased rightwardly (Fig. 8) by a spring unit 190 and that the rear end of the walking beam 146 is biased downwardly by a spring unit 192 to insure continued engagement of the followers with the respective cams at all times.

The result of the rectangular movement of the front end of the feed and cutter assembly 40 can best be understood by referring to Fig. 11. The working end 96 of the feed element 92 will, as the motion of the assembly is achieved, repeatedly engage between successive adjacent pairs of fastener elements E and move them rightwardly one element's pitch. The result is that one complete turn of the shaft 24 results in the rightward stepping of the line of slide fastener elements by the pitch of one element. As this movement is repeated again and again, the lines of slide fastener elements are moved together through the sewing foot and the lines are held in such a position in the channels 44 and 46 by the defining flanges 52a, 52b and 54a, 54b as well as the wire element 50, that the needles 14 (Fig. 1) in their normal stroking sew each successive element to the fabric F.

As well shown in Fig. 2, a cylinder piston unit 200 has its upper end pivotally attached by a pin 202 to the upper end 22a of the plate 22. A downward piston shaft from the unit 200 is attached to a clevis 204 which carries a pin 206. The pin 206 engages a link 208 intermediate the ends thereof. The forward end of the link 208 is attached to a collar 210 on the upper end of the presser foot shaft 26. A cutter element depressor bar 220 is mounted in the plate 22 and extends downward to adjacent the base plate 70. As shown in Fig. 2, towards its left end the link 208 is slotted longitudinally as at 212. A transverse pin 214 mounted rigidly on
the depressor bar 220 is disposed in the slot 212. Piv-
otally attached to the rear end of the link 208 is a second
link 230 as by a pin 232. The lower end of the link 230 is
pivotally attached as by a pin 234 to the arm 172 of the
override cam 170.

As shown in Figs. 9 and 10, the lowering of the arm 172
causes the nose 170a to engage the follower 130 to over-
ride the cam 180 (Fig. 13) and spring unit 190 to cause the
follower 130 to move leftwardly irrespective of the posi-
tion of cam 180. This, of course, causes the full retraction
or rightward movement (Fig. 2) of the feed and cutter assem-
bly 40.

In operation, the lowering of the arm 172, as shown in Figs.
8, 9 and 10, is accomplished by the lowering of the clevis
204 (Fig. 2) by the piston cylinder assembly 200 actuated by
means not shown. The lowering of the clevis 204, of course,
lowers the rightward end of the link 208. Simultaneously,
the lowering of link 208 through the pin 214 causes the de-
pressing of the depressor bar 220. This causes the engage-
ment of the lower pointed end of the depressor bar 220 with
the bed plate 70 (compare Figs. 9 and 10). It is seen that
doing this during this time, because of the override nose
170a engaging the follower 130, the feed and cutter assembly
40 is immobilized from horizontal reciprocation even though
the needles 14 and feed means 17 of the sewing machine may
continue to operate.

The depressing of the bed plate 70 by bar 220 moves the
front end of the assembly 40 down. Because as they lower,
the ends 96 of the feed blade 92 engage the connecting
threads C. The further lowering of the front end of the as-
sembly 40 causes feed blade 92 to bottom out on surface 35a
(Fig. 10) and slide up on pins 80, 82, thus forcing spring
plate 76 to yield. As the front end goes lower, the cutter
blade 86 cuts the cords C between two elements.
It should be noted that even with the depressor bar 220 down, foot 20 and the forward end of the feed and cutter assembly 40 may be raised as the collar 210 and forward end of link 208 raise with the foot and the spring 128 (Fig. 2) compresses.

It should be clear that the control of the apparatus of the invention may be by means of a suitable solid state device. Such devices can be selectively programmed to control the length of the zipper, length of pre-zipper and post-zipper anchoring stitches, etc.

The apparatus of the invention produces a reliable means to attach slide fastener strips directly to the fabric of a garment or the like. It is important to understand that there is substantial demand for such means.
THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:-

1. Apparatus for use in attaching slide fastener elements directly to the fabric of a garment or the like, of the type including an indexing blade engagable between adjacent fastener elements of a line of fastener elements, a driven linkage including a base plate driven by the sewing machine for moving the blade in a repetitive path to engage the line from above and to index the fastener elements in a step-by-step fashion past a reciprocating needle of the sewing machine, and a selectively actuable mechanism for severing cords interconnecting the line of fastener elements on completion of the sewing of a selected number of fastener elements to the fabric, characterized in that a direct drive is provided from the sewing machine to the driven linkage for operating the driven linkage in timed relation with reciprocation of the needle of the sewing machine, said indexing blade is yieldably mounted on the base plate, and a cutter blade is rigidly mounted on the base plate adjacent the indexing blade, whereby upon actuation of the selectively actuable mechanism, the base plate lowers below its normal lower limit and the indexing blade yields permitting the cutter blade to sever the cords.

2. Apparatus according to claim 1, characterized in that the driven linkage is supported solely by the body of the sewing machine and, in running operation, is independent of and isolated from movements of the reciprocating needle or of the presser foot of the sewing machine.

3. Apparatus according to claim 1, characterized by a drive for driving the indexing blade and cutter blade and base member thereadjacent in an up-and-down and back-and-forth rectangular pattern of motion so that the feed blade engages successive fastener elements and pulls the ladder step-by-step fashion to the sewing station, and members
for momentarily restricting the back-and-forth movement of the base plate at a position adjacent the blades thereby terminating the feed, and for depressing the base plate adjacent the blades below the usual lower limit of up-and-down travel so that the indexing blade yields as it engages the connector cords but the cutter blade moves downward and severs the connector cords.

4. Apparatus according to claim 3, characterized in that the drive includes a pair of cam followers associated with the base plate, one of the cam followers controlling the back-and-forth movement, the other controlling the up-and-down movement; the cam followers cooperating with cams driven in timed relation to the sewing machine.

5. Apparatus as claimed in claim 4, characterized in that the member for momentarily restricting the back-and-forth movement of the base plate includes a member adapted to override the action of the cam against the follower controlling the back-and-forth movement.

6. Apparatus as claimed in claim 5, characterized in that the override member and the depressor member are operated simultaneously by a pneumatic drive.

7. Apparatus as claimed in claim 5, characterized in that the override member is a lever pivotally mounted on the cam shaft and adapted when in the override position to move the said one follower away from its associated cam.

8. Apparatus as claimed in claim 1, characterized in that the indexing blade and cutter blade extend parallel to each other and are mounted on pins extending forward from the base plate, the indexing blade receiving the pins through ample openings, and a spring member extends from the top of the base plate to urge downwardly the indexing blade on its mounting on the pins but yielding to permit upward movement.
of the indexing blade on the pins when the indexing blade is urged upwardly with respect to the base member.

9. Apparatus as claimed in claim 1, characterized in that the presser foot includes track members adapted to engage the opposite sides of the fastener elements, and wire members to engage the U-shaped element from the inside.

10. Apparatus as claimed in claim 9, characterized by a presser foot adapted to guide and present the fabric and the ladder in the desired relation to the needle at the sewing station; the presser foot having an opening therethrough extending in a direction parallel to the sewing line, a feed and cutter assembly comprising a generally horizontal elongate element having a forward end extending through the opening of the presser foot and mounting said indexing blade and said cutter blade on the front end thereof, the cutter blade being rigidly mounted and the feed blade being resiliently mounted, the blades both being downwardly directed, spaced and parallel, a pair of arms supporting the elongate element, the arms each having a cam follower associated therewith, the first arm and associated first follower adapted to move the elongate element in a back-and-forth movement and the second arm and associated second follower adapted to move the front end of the elongate element in an up-and-down motion, and, rotary cams driven in timed relation to the sewing machine and adapted to be engaged by the two followers to produce the aforementioned movements.

11. Apparatus for use in attaching slide fastener elements directly to the fabric of a garment or the like substantially as hereinbefore described with reference to the accompanying drawings.

Dated this 27th day of May, 1980.

SCOVILL INC.,
By their Patent Attorneys,
COLLISON & CO.