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(54) **FASTENER ATTACHING TOOL AND FASTENER CLIP FOR USE THEREWITH**

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Description

BACKGROUND OF THE INVENTION

[0001] The present invention relates to a new and novel fastener attaching tool and fastener clip for use therewith particularly well-suited for use in coupling or recoupling buttons or the like to a garment or similar material or in other consumer applications.

[0002] The conventional method of attaching buttons to garments or fabrics, either by machine or by hand, is with thread. The button is held in place and a needle containing thread is inserted through each of two, three or more holes in the button and into the material several times until sufficient strands of thread exist to securely hold the button to the material. The thread must then be tied or otherwise fastened so that it will not unravel. In some instances, where it is desired to elevate the button from the material, a pedestal effect is achieved by laterally wrapping the strands with additional thread. The disadvantages to this method of securing buttons to fabric or garments are several. First of all, it is a slow and tedious job and the button can soon become detached if only one of the threads is severed or if the ends of the thread are not secured properly.

[0003] In the commonly assigned U.S. Pat. Nos. 3,399,432, 3,470,834, and 3,494,004, all of which are incorporated herein by reference, there is described a plastic fastener which may be used instead of thread to attach a button to an article of clothing. The fastener typically comprises a flexible filament having a head at one end and a transverse bar at the opposite end. A plurality of such fasteners are typically manufactured as part of a clip in which the fasteners are interconnected in a row to a stringer or runner bar connected to the transverse bars of the fasteners by corresponding necks or connector posts. To sever an individual fastener from the fastener clip and to attach the severed fastener to a desired article (e.g., through a button hole and into an article of clothing), a fastener attaching device is typically used. Such a device typically comprises a casing, a needle projecting from the casing, the needle and the casing having longitudinal bores in alignment with each other, a plunger slidable back and forth within said bores, a handle telescoping over the rear of the casing for sliding said plunger within said bores, and means for feeding fasteners into the device successively with the transverse bars in alignment with said bores ahead of the plunger so that they may be projected through the needle by reciprocating the plunger. Typically, the rear end of the needle is shaped to define a knife edge so that insertion of the transverse bar into the longitudinal bore of the needle using the plunger causes the knife edge of the needle to sever the connector post connecting the fastener to the remainder of the fastener clip.

[0004] While the above-described fasteners have been found to be generally satisfactory for attaching

buttons to certain articles of clothing, they have not found universal application for the following reasons: First, when placed in direct contact with a person's skin, the transverse bar of the fastener has a tendency to be irritating. This is in part because the above-described severing of the connector post often leaves a burr on the bottom of the transverse bar and is in part because of the somewhat sharp ends and large size of the transverse bar. Second, the fasteners are often too big to be used with many buttons and, therefore, require the use of specially designed buttons having large holes. Third, the fasteners tend to be conspicuous in appearance due to the fact that a separate fastener is used for every button hole, as opposed to being looped between two or more button holes in the same way that thread typically is.

[0005] Another button attaching device and method of fastening buttons is known as prior art (US 3,900,925) using a flexible fastener comprising a vertical shank with an enlarged head at one end and an angular crossbar at the opposite end. The known fastener is to be introduced in a longitudinal slot of a needle and the needle carries the fastener through a hole of a button and through a material to which it is to be attached. In case of a two hole button, the fastener is turned in place to enable the smaller angled leg of the fastener to enter the needle and both are thrust through the second hole in the button and the material.

[0006] Furthermore, US 4,611,740 describes a plastic fastener attaching device where a clip of a plurality of fasteners (tag attachments) is connected at one end to a runner bar to provide a fastener clip. Each fastener comprises one T-bar end and one paddle end which both are connected to one another by a thin filament. The fasteners can be severed from the runner bar and attached by a needle assembly. The severing leaves a burr on the T-bar end of the fastener facing away from the underside of a garment onto which a button is fixed by this attaching device and may therefore result in irritation of the skin of the wearer of the respective garment.

[0007] Furthermore, a device is known from US 5,020,713 for attaching flexible filaments with T-bar ends, which comprises a first and a second needle with bores to fix an attachment with a first and a second T-bar end to a plurality of materials or articles. A plurality of attachments form an attachment clip by connecting bars on each end of the attachments and have to be severed by cutting means. This attaching device comprises an ejector mechanism displaceable relative to the pair of needles. The bores of the needles have to be specially formed to pivot the originally parallel oriented T-bar ends of the attachment parallel to the surface of layers to be fixed after the T-bar ends are released from the needles.

SUMMARY OF THE INVENTION

[0008] It is an object of the present invention to provide a new and novel fastener clip including one or more fasteners particularly well-suited for attaching a button or the like to a garment or similar material.

[0009] It is another object of the present invention to provide a fastener clip as described above whose fasteners are less irritating than existing like fasteners when used in such a way that they are placed in direct contact with a person's skin.

[0010] It is still another object of the present invention to provide a fastener clip as described above whose fasteners are sized for use with conventional buttons.

[0011] It is still yet another object of the present invention to provide a fastener clip as described above whose fasteners, when used to attach buttons to a garment or the like, can achieve a look similar to that achieved with thread.

[0012] It is a further object of the present invention to provide a fastener clip as described above whose fasteners are designed for maximum strength while still permitting installation through very small holes such as are found in fine garments.

[0013] It is still a further object of the present invention to provide a fastener clip as described above which can be mass produced and which is capable of including a plurality of fasteners.

[0014] It is yet still another object of this invention to provide a fastener attaching tool which is adapted for use with the fastener clip referred to above.

[0015] Additional objects, features, and advantages of the present invention will be set forth in part in the description which follows, and in part will be obvious from the description or may be learned by practice of the invention. The objects, features and advantages of the invention are realized and attained by means of the fastener, fastener clip and fastener dispensing tool of claims 1, 6 and 13 respectively.

[0016] In a preferred embodiment of the fastener clip aspect of the invention, the fastener clip is a molded plastic structure defining a pair of runner bars and at least one fastener, the fastener comprising a U-shaped filament having a foot at each end, each foot being sized and shaped both to fit through a button hole and, once inserted through the button hole and an underlying garment, to securely engage the underside of the garment. Because of its loop design, the fastener is permitted to extend between adjacent button holes, thereby creating the illusion of thread.

[0017] To minimize contact with a person's skin, the feet of the present fastener are preferably shorter than the transverse bars of existing button fasteners and are preferably comparable in overall size to a knot of thread used to secure a button to a sheet of clothing material. In addition, the feet preferably have rounded ends and a flat top surface to minimize irritation of and contact with a person's skin. The filament portion of the fastener is

preferably rectangular in cross-section and has a non-uniform thickness, i.e., being thinner at the ends and thicker in the arcuate region, to maximize the strength of the fastener.

[0018] The fastener is preferably connected to the pair of runner bars by a pair of severable connector posts, each connector post extending between the side of one of the feet and a corresponding runner bar so that, when the connector post is severed, a burr is not left on the underside of the feet where it may irritate a person's skin.

[0019] The outer edges of the runner bars are preferably provided with indentations which, as will be discussed below, are used to properly feed the fastener clip into a fastener attaching tool.

[0020] In a preferred embodiment of the fastener attaching tool of this invention, the fastener attaching tool comprises a body, a needle block, a pair of needles, a spring, and an ejector mechanism.

[0021] Each of the pair of needles includes a longitudinally extending slotted bore adapted to receive one of the transverse bars of the fastener, with the adjacent end of the filament extending through the slot in the bore. The needles are mounted in a parallel arrangement in the needle block which, in turn, is removably mounted in a cavity formed in the front end of the body. Each needle has a knife edge formed on its outer side which is adapted to sever a connector post from its associated transverse bar as the transverse bar is pushed by it.

[0022] The body is also shaped to include a transverse feed slot disposed just to the rear of the needles down through which the above-described fastener clip is manually inserted. To assist in properly aligning the fastener clip within the feed slot so that the transverse bars of a desired fastener are aligned with the longitudinal bores of the needles, the inner walls of the slot are shaped to include a pair of feed bars which engage corresponding indentations formed on the outer sides of the fastener clip.

[0023] The ejector mechanism, which is slidably mounted back and forth within the body and is rearwardly biased by the spring, is manually operable from the rear of the body. Actuation of the ejector mechanism is preferably achieved using one's thumb, and the body is provided with a pair of finger openings so that the device may be held and used like a syringe. The ejector mechanism includes a pair of ejector rods which are slidable back and forth within the longitudinal bores of the needles and are used both to load the transverse bars of the aligned fastener into the longitudinal bores of the needles and to push the transverse bars therethrough into a desired article.

BRIEF DESCRIPTION OF THE DRAWINGS

[0024] The accompanying drawings, which are hereby incorporated in and constitute a part of this

specification, illustrate the preferred embodiments of the invention and, together with the description, serve to explain the principles of the invention. In the drawings, wherein like reference numerals represent like parts:

Fig. 1 is a front view of one embodiment of a fastener clip constructed according to the teachings of the present invention;

Fig. 2 is a bottom view of the fastener clip shown in Fig. 1;

Fig. 3 is an enlarged front perspective view of one of the fasteners shown in Fig. 1 after it has been separated from the remainder of the fastener clip;

Fig. 4 is a top view of one embodiment of a fastener attaching device constructed according to the teachings of the present invention for attaching an individual fastener from the fastener clip of Fig. 1 to a garment through a pair of button holes in such a way as to attach the button to the garment;

Fig. 5 is a partially exploded top view of the fastener attaching device shown in Fig. 4 with the body being broken away in part;

Fig. 6 is a section view of the body shown in Fig. 5 taken along line A-A;

Figs. 7(a) through 7(d) are front, rear, top and right side views, respectively, of the needle block shown in Fig. 5;

Fig. 8 is a section view of the body shown in Fig. 5 taken along line B-B;

Figs. 9(a) through 9(d) are top, right side, left side and rear views, respectively, of one of the needles shown in Fig. 5;

Figs. 10(a) and 10(b) are bottom and right side views, respectively, of the ejector mechanism shown in Fig. 5;

Fig. 11 is a top view, broken away in part, of a second embodiment of a fastener attaching device constructed according to the teachings of the present invention for attaching an individual fastener from the fastener clip of Fig. 1 to a garment through a pair of button holes in such a way as to attach the button to the garment;

Fig. 12 is an enlarged section view of the front end of the fastener attaching device of Fig. 4 shown with the pair of ejector rods in an advanced position to illustrate how one of the fasteners shown in Fig. 1 may be inserted through a pair of button holes and secured to a garment;

Fig. 13 is an enlarged section view similar to Fig. 12 but after the fastener attaching device has been removed showing how one of the fasteners shown in Fig. 1 is used to attach a button to a garment;

Fig. 14 is a top view of the combination of the button, garment and fastener shown in Fig. 13;

Fig. 15 is a fragmentary front view of a second embodiment of a fastener clip constructed according to the teachings of the present invention;

Fig. 16 is a left side view of the fastener clip shown

in Fig. 15; and

Fig. 17 is a top view of the fastener clip shown in Fig. 15.

5 DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

[0025] Referring to the drawings and in particular to Figs. 1 and 2, there are shown front and bottom views, respectively, of a fastener clip constructed according to the teachings of the present invention, the fastener clip being represented generally by reference numeral 11.

[0026] Clip 11 is a unitary structure preferably molded from polyurethane or similar materials. Clip 11 comprises five identical fasteners 13, the number of fasteners being illustrative only. Each fastener 13 includes a flexible U-shaped filament 15 and a pair of transverse bars or feet 17-1 and 17-2 disposed at opposite ends thereof. To maximize the strength of the fastener, filament 15 is preferably rectangular in cross-section and has a non-uniform thickness, i.e., the arcuate region 16 has a thickness t_1 greater than the thickness t_2 at the ends. Feet 17-1 and 17-2 are appropriately dimensioned so that they may be inserted into a desired garment through a pair of button holes of conventional size and thereafter be retained by the underside of the garment.

[0027] Clip 11 also comprises a pair of runner bars 19-1 and 19-2, the top ends of which are joined to form a handle 21. The outer edges of runner bars 19-1 and 19-2 are provided with indentations 24 which, as will be seen below, assist in properly feeding clip 11 into a fastener attaching tool.

[0028] Each fastener 13 is connected to runner bars 19-1 and 19-2 by severable connector posts 23-1 and 23-2, respectively. For reasons to be discussed below, connector posts 23-1 and 23-2 are connected to the outer sides 25-1 and 25-2 of feet 17-1 and 17-2, respectively.

[0029] In order that fastener 13 may be used with garments in which feet 17-1 and 17-2 may be placed in direct contact with a person's skin, fastener clip 11 includes the following features which are designed to minimize irritation of a person's skin. First, as noted above, connector posts 23-1 and 23-2 are connected to the outer sides 25-1 and 25-2 of feet 17-1 and 17-2. In this manner, when posts 23-1 and 23-2 are severed, burrs 27-1 and 27-2 (see Fig. 3) are left on outer sides 25-1 and 25-2, where they are not as likely to come into contact with a person's skin as they would be if they were left on the bottom surface of feet 17-1 and 17-2. Second, feet 17-1 and 17-2 have a length l which is comparatively small, i.e., approximately 2 mm as compared to 6 mm for the transverse bars of existing like fasteners, and an overall size which is comparable to that of a knot of thread. Consequently, feet 17-1 and 17-2 have relatively little surface area which may come into contact with a person's skin. Third, the top surfaces 29-

1 and 29-2 of feet 17-1 and 17-2, respectively, are generally flat. This gives feet 17-1 and 17-2 a low profile and inhibits the rotational movement of feet 17-1 and 17-2 relative to the underside of a garment to which fastener 13 has been attached (see Fig. 13). Fourth, feet 17-1 and 17-2 have rounded ends 31-1/31-2 and 33-1/33-2, respectively.

[0030] To use fastener 13 to couple a button to a garment, an individual fastener 13 is first detached from fastener clip 11 by severing connector posts 23-1 and 23-2. Feet 17-1 and 17-2 of the severed fastener 13 are then inserted first through a corresponding pair of button holes and then through the desired garment. Both the severing and inserting steps may be done manually or with the aid of an appropriate fastener attaching tool.

[0031] Referring now to Figs. 4 and 5, there is shown one embodiment of a fastener attaching tool suitable for use with fastener clip 11 in the above-described manner, the fastener attaching tool being represented generally by reference numeral 51.

[0032] Tool 51 includes a body 53, a needle block 55, a pair of needles 57-1 and 57-2, a spring 59, and an ejector mechanism 61.

[0033] Body 53 is a unitary structure preferably molded from a lightweight durable plastic. Body 53 is shaped to define a pair of transverse openings 63-1 and 63-2 which are provided so that a user may operate tool 51 like a syringe by placing the index and middle fingers through openings 63-1 and 63-2 while actuating ejector mechanism 61 with the thumb. Body 53 is also provided with a transversely extending feed slot 64 down through which fastener clip 11 may be inserted in a direction perpendicular to the longitudinal axis of body 53. As can be seen best in Fig. 6, slot 64 is shaped to include a pair of feed bars 64-1 and 64-2 which, as will be discussed below in greater detail, are used to engage indentations 25 on runner bars 19-1 and 19-2, respectively, to properly align fastener clip 11 within tool 51.

[0034] Needle block 55, which is removably mounted in a cavity 65 formed in body 53 and accessible from the front end thereof, is shown in greater detail in Figs. 7(a) through 7(d). As can be seen therein, block 55 is a generally rectangular unitary structure having a pair of generally cylindrically shaped grooves 67-1 and 67-2 adapted to receive needles 57-1 and 57-2, respectively. Block 55 is retained within opening 65 by means of a plurality of outwardly biasing tabs 69-1 through 69-3 which snap into place in corresponding slots 71-1 through 71-3 (see Fig. 8) in cavity 65.

[0035] Block 55 is also preferably molded from a lightweight durable plastic.

[0036] Needle 57-1, which is a mirror image of needle 57-2 reflected along its longitudinal axis, is shown in greater detail in Figs. 9(a) through 9(d). As can be seen therein, needle 57-1 is a unitary structure shaped to include a generally cylindrical slotted bore 73-1. Bore 73-1 has a cross-sectional diameter slightly larger than that of foot 17-1 of fastener 13. The forward end 75-1 of

needle 57-1 is pointed to permit its insertion through garments and button holes of conventional size. The rearward end 77-1 of needle 57-1 is open and is appropriately dimensioned to permit foot 17-1 to be loaded into bore 73-1 with the adjacent end of filament 15 extending through the slot of bore 73-1. Needle 57-1 is retained within groove 67-1 of block 55 by means of a downwardly-angled fin 79-1 which engages a corresponding slot 81-1 in groove 67-1 (see Figs. 7(b) and 7(c)).

[0037] The left side of needle 57-1 (viewing needle 57-1 from its rearward end 77-1 as opposed to its forward end 79-1) is shaped to define a knife 83-1. As will be described below in greater detail, knife 83-1 is used to sever the connecting post 23-1 connecting a desired fastener 13 to runner bar 19-1. (A corresponding knife edge formed on the right side of needle 57-2 is similarly used to sever the connecting post 23-2 connecting the same fastener to runner bar 19-2.)

[0038] Needles 57-1 and 57-2 are preferably cut and stamped from sheet metal.

[0039] Ejector mechanism 61, which is shown in greater detail in Figs. 10(a) and 10(b), is slidably mounted within a longitudinally extending channel 89 formed in body 53 and accessible from the rear end thereof. As can be seen therein, mechanism 61 comprises an elongated generally rectangular ejector block 91 having a front portion 91-1 of comparatively smaller cross-section and a rear portion 91-2 of comparatively larger cross-section. A pair of ejector rods 93-1 and 93-2 are fixedly mounted on the forward end of front portion 91-1. As will hereinafter be described in greater detail, ejector rods 93-1 and 93-2 are appropriately dimensioned and properly positioned so that, as ejector block 91 moves through channel 89, the front ends of ejector rods 93-1 and 93-2 cause feet 17-1 and 17-2 of a fastener 13 which is properly disposed within slot 64 to be loaded onto needles 57-1 and 57-2 and thereafter to be ejected therefrom. A disc-shaped base 95 is fixedly mounted on the rearward end of rear portion 91-2 to facilitate manipulation of mechanism 61.

[0040] Ejector rods 93-1 and 93-2 are preferably made of metal, and the remainder of ejector mechanism 61 is preferably molded from lightweight durable plastic.

[0041] Longitudinal movement of mechanism 61 within channel 89 is restricted by base 95 and by a pair of integrally formed posts 97-1 and 97-2 disposed on the top and bottom surfaces, respectively, of rear portion 91-2 which travel in corresponding guide slots 99-1 and 99-2 (see Fig. 5) formed in body 53. Posts 97-1 and 97-2 are made to be depressible inwardly to permit insertion of block 91 into channel 89. Spring 59, which engages the front of channel 89 at one end and the forward end of rear portion 91-2 at the opposite end, biases ejector mechanism 61 towards the rear of channel 89.

[0042] A fastener dispensing tool similar in construction to tool 51 is shown in Fig. 11, the tool being

represented generally by reference numeral 101. The differences between tool 101 and tool 51 are few, the principal differences being the shape of body 103, the lack of a base 95 in tool 101, and the construction of spring 105. Tool 101 is operated in the same way as tool 51.

[0043] In use, a desired fastener clip 11 is loaded into tool 51 by grasping handle 21 and pushing the clip down through slot 64 until the indentations 24 on runner bars 19-1 and 19-2 corresponding to a desired fastener 13 are engaged by bars 64-1 and 64-2. With this done, feet 17-1 and 17-2 of the desired fastener 13 are positioned behind needles 57-1 and 57-2, respectively, and are in alignment with their corresponding bores 73-1 and 73-2.

[0044] To attach a button to a piece of fabric using the fastener loaded in the above manner, the tips 75-1 and 75-2 of needles 57-1 and 57-2, respectively, are inserted first through a pair of holes in the button and then through the piece of fabric. Ejector mechanism 61 is then advanced through channel 89 towards the front of body 53. The initial advancement of ejector mechanism 61 causes ejector rods 93-1 and 93-2 to push feet 17-1 and 17-2 of the desired fastener 13 into bores 73-1 and 73-2. As the advancement of ejector mechanism 61 continues, ejector rods 93-1 and 93-2 push feet 17-1 and 17-2 past knife edges 83-1 and 83-2 of needles 57-1 and 57-2, causing connector posts 23-1 and 23-2 to be severed thereby. Finally, as the advancement of ejector mechanism 61 terminates, ejector rods 93-1 and 93-2 cause feet 17-1 and 17-2 to be ejected from the front ends of needles 57-1 and 57-2. Ejector mechanism 61 is then allowed to retract and needles 57-1 and 57-2 are withdrawn.

[0045] Fig. 12 shows a fastener 13 being inserted through a pair of button holes B₁ and B₂ and into a piece of fabric F using tool 51.

[0046] Referring now to Figs. 13 and 14, there are shown section and top views, respectively, of a button B which has been coupled to a piece of fabric F using fastener 13. As seen best in Fig. 13, the advantages resulting from gating fastener 13 to runner bars 19-1 and 19-2 on the outer sides of feet 17-1 and 17-2 are substantial as burrs 27-1 and 27-2 are not left on the bottoms of feet 17-1 and 17-2 where they are most likely to irritate a person's skin. The consequences of making the top surfaces of feet 17-1 and 17-2 flat, as opposed to curved, to give feet 17-1 and 17-2 a low profile as well as to keep feet 17-1 and 17-2 from rocking in the directions indicated by arrows C and D can also be seen in Fig. 13. As seen best in Fig. 14, another benefit to fastener 13 is that, by having filament 15 extend between button holes B₁ and B₂ in a looped fashion, it creates the appearance that thread, as opposed to a plastic fastener, is being used to secure the button to the fabric.

[0047] Referring now to Figs. 15 through 17, there are shown various views of a second embodiment of a fastener clip constructed according to the teachings of

the present invention, the fastener clip being represented generally by reference numeral 131.

[0048] Fastener clip 131 includes a plurality of identical fasteners 133, each fastener 133 including a flexible filament 134 having a head 135 at one end and a foot 137 at the opposite end. Foot 137 is similar in size and shape to feet 17-1 and 17-2 of fastener 13. Fastener clip 131 also includes a runner bar 141 which is severably connected to fasteners 133 by connector posts 143, each connector post 143 being connected to the side of its corresponding foot 137.

[0049] The embodiments of the present invention recited herein are intended to be merely exemplary and those skilled in the art will be able to make numerous variations and modifications to it without departing from the scope of the present invention as defined by the claims appended hereto.

Claims

1. A fastener (13, 133) for attaching a button (B) to a piece of fabric (F), said button (B) having two or more holes, said fastener (13, 133) comprising a flexible filament (15) U-shaped prior to use, a first transverse bar (17-1) at one end of said flexible filament, and a second transverse bar (17-2) at the opposite end of said flexible filament (15), said flexible filament and said pair of transverse bars (17-1, 17-2) being appropriately dimensioned so that said pair of transverse bars (17-1, 17-2) may be inserted through a corresponding pair of holes in the button (B) and then through the piece of fabric, with said U-shaped filament (15) looping between the pair of holes.
2. The fastener (13, 133) according to claim 1, wherein said flexible filament (15) and said pair of transverse bars (17-1, 17-2) are integrally formed as a molded plastic structure.
3. The fastener (13, 133) according to claim 1, wherein said flexible filament (15) is rectangular in cross section and has a greater thickness in its arcuate region than at its ends.
4. The fastener (13, 133) according to claim 1, wherein each of said first and said second transverse bars (17-1, 17-2) has a flat top surface.
5. The fastener (13, 133) according to claim 1, wherein each of said first and second transverse bars (17-1, 17-2) has rounded ends.
6. A fastener clip (11) adapted to be fed into a fastener attaching tool (51, 101), said fastener clip comprising:

a) a fastener (13), said fastener (13) compris-

- ing a flexible U-shaped filament (15) and a first transverse bar (17-1) at one end of said flexible filament (15), said transverse bar (17-1) having a pair of sides and a bottom surface;
- b) a first runner bar (19-1); and
- c) a first connector post (23-1) connected at a first end to said first runner bar (19-1) and severably connected at a second end to said fastener (13), said second end of said first connector post (23-1) being connected to one of the sides of said first transverse bar (17-1) of said fastener (13) so that, when severed from said first transverse bar (17-1), said second end of said first connector post (23-1) does not leave a burr (27) on the bottom of said first transverse bar (17-1).
7. The fastener clip (11, 131) according to claim 6, wherein said second end of said first connector post (23-1, 143) is severably connected to the side of first transverse bar (17-1, 137).
8. The fastener clip (11) according to claim 7, wherein said flexible filament (15) is U-shaped, said fastener further comprising a second transverse bar (17-2) at the opposite end of said flexible filament (15).
9. The fastener clip (11) according to claim 8, further comprising a second runner bar (19-2) and a second connector post (25-2) being connected at a first end to said second runner bar (19-2) and severably connected at a second end to the side of said second transverse bar (17-2).
10. The fastener clip (11) according to claim 9, wherein said first connector post (25-1) and said second connector post (25-2) are connected to the outer sides of said first transverse bar (17-1) and said second transverse bar (17-2), respectively.
11. The fastener clip (11) according to claim 10, wherein at least one of said first runner bar (19-1) and said second runner bar (19-2) is provided with means for properly aligning said fastener within said fastener attaching tool (51, 101).
12. The fastener clip (11) according to claim 11, wherein said aligning means comprises an indentation (24) formed along the outer side of at least one of said first runner bar (19-1) and said second runner bar (19-2).
13. A tool (51, 101) for dispensing individual fasteners (13) from a fastener clip (11) into a desired article, the fastener clip (11) comprising a pair of generally parallel runner bars (19-1, 19-2) and one or more fasteners (13), each fastener (13) comprising a flexible filament (15) and a pair of transverse bars (17-

1, 17-2) disposed at opposite ends thereof, the flexible filament (15) being disposed in the plane of the pair of generally parallel runner bars (19-1, 19-2), each of the pair of transverse bars (17-1, 17-2) being connected to a corresponding runner bar by a connector post, the connector posts (23-1, 23-2) being severably connected to the outer sides of their respective transverse bars (17-1, 17-2), said tool (51, 101) comprising:

- a) a body (53);
- b) a pair of needles (57-1, 57-2) projecting from the front of the body (53), each of said needles (57-1, 57-2) having a front end adapted to insertion into the article, a longitudinally extending bore appropriately dimensioned to permit one of the transverse bars of the fastener (13) to slide thereacross, said longitudinally extending bore being slotted to permit the end of the filament (15) adjacent to the transverse bar to extend therethrough, and a knife edge (83) appropriately positioned on the outer side of said needle (57) to cut the connector post as the transverse bar passes by; and
- c) a pair of ejector rods (93-1, 93-2) slidable back and forth through said needles (57) and manually operable through an opening in the rear of the body (53) for pushing the transverse bars (17-1, 17-2) of the fastener (13) into and through said longitudinally extending bores of said needles (57) into the desired article.

14. The tool (51, 101) according to claim 13, wherein said body (53, 103) has a slot extending downwardly from its top behind said needles (57-1, 57-2) through which the fastener clip (11) may be inserted for positioning the transverse bars (17-1, 17-2) of a desired fastener (13) directly behind said longitudinally extending bores of said needles (57-1, 57-2).
15. The fastener attaching tool (51, 101) according to claim 14, wherein said slot and the pair of runner bars (19-1, 19-2) are provided with cooperative registration elements for assisting proper alignment of the transverse bars (17-1, 17-2) with said longitudinally extending bores of said needles (57-1, 57-2).
16. The fastener attaching tool (51, 101) according to claim 15, wherein said cooperative registration elements include indentations (24) on the outer sides of the runner bars (19-1, 19-2) and bars formed on the corresponding inside walls of said slot.

Patentansprüche

1. Befestiger (13, 133) zum Anbringen eines Knopfes (B), der zwei oder mehr Löcher hat, an einem Stoff-

stück (F), wobei der Befestiger (13, 133) ein biegsames Filament (15), das vor der Verwendung U-förmig ist, einen ersten Querbalken (17-1) an einem Ende des biegsamen Filaments, und einen zweiten Querbalken (17-2) am gegenüberliegenden Ende des flexiblen Filaments (15) aufweist, wobei das biegsame Filament und das Paar der Querbalken (17-1, 17-2) in geeigneter Weise so dimensioniert sind, daß das Paar der Querbalken (17-1, 17-2) durch ein entsprechendes Paar von Löchern in dem Knopf (B) und dann durch das Stoffstück eingesetzt werden kann, wobei das U-förmige Filament (15) zwischen dem Paar von Löchern eine Schleife bildet.

2. Befestiger (13, 133) nach Anspruch 1, wobei das flexible Filament (15) und das Paar der Querbalken (17-1, 17-2) integral als geformte Plastikstruktur ausgebildet sind.

3. Befestiger (13, 133) nach Anspruch 1, wobei das flexible Filament (15) im Querschnitt rechteckig ist und in seinem bogenförmigen Abschnitt dicker ist als an seinen Enden.

4. Befestiger (13, 133) nach Anspruch 1, wobei jeder der ersten und zweiten Querbalken (17-1, 17-2) eine flache obere Oberfläche hat.

5. Befestiger (13, 133) nach Anspruch 1, wobei jeder der ersten und zweiten Querbalken (17-1, 17-2) abgerundete Enden hat.

6. Befestigerclip (11), der in ein Werkzeug zum Anbringen eines Befestigers (51, 101) einzuführen ist, wobei der Befestigerclip enthält:

a) einen Befestiger (13), wobei der Befestiger (13) ein flexibles U-förmiges Filament (15) und einen ersten Querbalken (17-1) an einem Ende des flexiblen Filaments (15) aufweist, wobei der Querbalken (17-1) ein Paar von Seiten und eine untere Oberfläche hat;

b) einen ersten Angussbalken (19-1); und

c) eine erste Verbindungsbrücke (23-1), die an einem ersten Ende mit dem ersten Angussbalken (19-1) und abtrennbar am zweiten Ende mit dem Befestiger verbunden ist, wobei das zweite Ende der ersten Verbindungsbrücke (23-1) mit einer der Seiten des ersten Querbalkens (17-1) des Befestigers (13) verbunden ist, so daß nach dem Abtrennen des ersten Querbalkens (17-1) das zweite Ende der ersten Verbindungsbrücke (23-1) keinen Grat auf dem Bogen des ersten Querbalkens (17-1) hinterläßt.

7. Befestigerclip (11, 131) nach Anspruch 6, wobei

das zweite Ende der ersten Verbindungsbrücke (23-1, 143) abtrennbar mit der Seite des ersten Querbalkens (17-1, 137) verbunden ist.

8. Befestigerclip (11) nach Anspruch 7, wobei das flexible Filament (15) U-förmig ist, und der Befestiger außerdem einen zweiten Querbalken (17-2) am gegenüberliegenden Ende des flexiblen Filaments (15) aufweist.

9. Befestigerclip (11) nach Anspruch 8, weiter aufweisend einen zweiten Angussbalken (19-2) und eine zweite Verbindungsbrücke (25-2), die an einem ersten Ende mit dem zweiten Angussbalken (19-2) verbunden ist und abtrennbar am zweiten Ende mit der Seite des zweiten Querbalkens (17-2) verbunden ist.

10. Befestigerclip (11) nach Anspruch 9, wobei die erste Verbindungsbrücke (25-1) und die zweite Verbindungsbrücke (25-2) mit den äußeren Seiten des ersten Querbalkens (17-1) bzw. des zweiten Querbalkens (17-2) verbunden sind.

11. Befestigerclip (11) nach Anspruch 10, wobei wenigstens einer von dem ersten Angussbalken (19-1) und dem zweiten Angussbalken (19-2) mit Mitteln zur korrekten Ausrichtung der Befestiger innerhalb des Werkzeugs (51, 101) zum Anbringen der Befestiger versehen ist.

12. Befestigerclip (11) nach Anspruch 11, wobei das Ausrichtungsmittel eine Einkerbung (24) umfaßt, die entlang der äußeren Seite von wenigstens einem des ersten Angussbalkens (19-1) und des zweiten Angussbalkens (19-2) ausgebildet ist.

13. Werkzeug (51, 101) zum Einbringen individueller Befestiger (13) von einem Befestigerclip (11) in einen gewünschten Artikel, wobei der Befestigerclip (11) ein Paar von im allgemeinen parallelen Angussbalken (19-1, 19-2) und einen oder mehrere Befestiger (13) umfaßt, jeder Befestiger (13) ein flexibles Filament (15) und ein Paar von Querbalken (17-1, 17-2) umfaßt, die auf gegenüberliegenden Enden hiervon angeordnet sind, wobei das flexible Filament (15) in der Ebene des Paares von allgemein parallelen Angussbalken (19-1, 19-2) angeordnet ist, jeder von dem Paar der Querbalken (17-1, 17-2) mit einem entsprechenden Angussbalken durch eine Verbindungsbrücke verbunden ist, die Verbindungsbrücken (23-1, 23-2) abtrennbar mit den äußeren Seiten ihrer jeweiligen Querbalken (17-1, 17-2) verbunden sind, und das Werkzeug (51, 101) enthält:

a) einen Körper (53);

b) ein Paar von Nadeln (57-1, 57-2), die von

- der Vorderseite des Körpers (53) herausragen, wobei jede der Nadeln (57-1, 57-2) ein vor-
res Ende hat, das zum Einsetzen in den Artikel
ausgebildet ist, eine sich longitudinal erstrek-
kende Bohrung mit geeigneter Dimensionie-
rung, um es einem der Querbalken des
Befestiger (13) zu erlauben, darüberzugleiten,
wobei die sich longitudinal erstreckende Boh-
rung geschlitzt ist, um es dem Ende des Fila-
ments (15) in der Nähe des Querbalkens zu
ermöglichen, sich hindurchzuerstrecken, und
eine Messerklinge (83), die geeignet auf der
Außenseite der Nadeln (57) positioniert ist, um
die Verbindungsbrücke abzuschneiden, wenn
der Querbalken vorüberläuft; und
c) ein Paar von Ausstoßstäben (93-1, 93-2), die
durch die Nadel (57) vor- und zurückgleitbar
sind und durch eine Öffnung im rückwärtigen
Teil des Körpers (53) manuell betätigbar sind,
um die Querbalken (17-1, 17-2) des Befesti-
gers (13) in und durch die sich longitudinal
erstreckende Bohrung der Nadeln (57) in den
gewünschten Artikel zu stoßen.
14. Werkzeug (51, 101) nach Anspruch 13, wobei der
Körper (53, 103) einen Schlitz aufweist, der sich
von seiner Oberseite hinter den Nadeln (57-1, 57-2)
nach unten erstreckt und durch den der Befesti-
gerclip (11) eingesetzt werden kann, um die Quer-
balken 817-1, 17-2) eines gewünschten Befestigers
direkt hinter die sich longitudinal erstreckenden
Bohrungen der Nadeln (57-1, 57-2) zu positionie-
ren.
15. Werkzeug (51, 101) zum Anbringen von Befesti-
gern nach Anspruch 14, wobei der Schlitz und das
Paar der Angussbalken (19-1, 19-2) mit zusam-
menwirkenden Paßelementen zur Unterstützung
der korrekten Ausrichtung der Querbalken (17-1,
17-2) mit den sich longitudinal erstreckenden Boh-
rungen der Nadeln (57-1, 57-2) versehen sind.
16. Werkzeug (51, 101) zum Anbringen von Befesti-
gern nach Anspruch 15, wobei die zusammenwir-
kenden Paßelemente Einkerbungen (24) an den
Außenseiten der Angussbalken (19-1, 19-2) und
Balken enthalten, die auf den entsprechenden
Innenwänden des Schlitzes ausgebildet sind.
- Revendications**
1. Dispositif de fixation (13,133) pour fixer un bouton
(B) à un morceau de tissu (F), ledit bouton (B) com-
portant deux ou plus de deux trous, ledit dispositif
de fixation (13,133) comprenant un filament flexible
(15) en forme de U avant son utilisation, une pre-
mière barrette transversale (17-1) sur une extrémité
audit filament flexible et une seconde barrette
transversale (17-2) sur l'extrémité opposée dudit
filament flexible (15), ledit filament flexible et ledit
couple de barrettes transversales (17-1, 17-2) étant
dimensionnées de façon appropriée de telle sorte
que ledit couple de barrettes transversales (17-1,
17-2) peut être inséré dans un couple correspon-
dant de trous formés dans le bouton (B), puis à tra-
vers le morceau de tissu, ledit filament en forme de
U (15) formant une boucle entre les trous du couple
de trous.
2. Dispositif de fixation (13,133) selon la revendication
1, dans lequel ledit filament flexible (15) et ledit cou-
ple de barrettes transversales (17-1, 17-2) sont for-
més d'un seul tenant sous la forme d'une structure
en matière plastique moulée.
3. Dispositif de fixation (13,133) selon la revendication
1, dans lequel ledit filament flexible (15) possède
une section transversale rectangulaire et a une
épaisseur plus importante dans sa partie courbe
qu'au niveau de ses extrémités.
4. Dispositif de fixation (13,133) selon la revendication
1, dans lequel chacune desdites première et
seconde barrettes transversales (17-1,17-2) pos-
sède une surface supérieure plane.
5. Dispositif de fixation (13,133) selon la revendication
1, dans lequel chacune desdites première et
seconde barrettes transversales (17-1,17-2) pos-
sède des extrémités arrondies.
6. Pince (11) pourvue d'un dispositif de fixation et apte
à être introduite dans un outil (51,101) de fixation
d'un dispositif de fixation, ladite pince pourvue d'un
dispositif de fixation comprenant :
- a) un dispositif de fixation (13), ledit dispositif
de fixation (13) comprenant un filament flexible
en forme de U (15) et une première barrette
transversale (17-1) située à une extrémité dudit
filament flexible (15), ladite barrette transver-
sale (17-1) comprenant un couple de côtés et
une surface inférieure;
- b) un premier montant (19-1); et
- c) une première tige de raccordement (23-1)
raccordée par une première extrémité, audit
premier montant (19-1) et raccordée, par une
seconde extrémité, de manière à pouvoir être
sectionnée audit dispositif de fixation (13),
ladite seconde extrémité de ladite première
tige de raccordement (23-1) étant raccordée à
l'un des côtés de ladite première barrette trans-
versale (17-1) dudit dispositif de fixation (13)
de sorte que, lorsqu'elle est sectionnée à partir
de ladite première barrette transversale (17-1),
ladite seconde extrémité de ladite première

tige de raccordement (23-1) ne laisse subsister aucune bavure (27) sur la partie inférieure de ladite première barrette transversale (17-1).

7. Pince (11,133) pourvue de dispositifs de fixation selon la revendication 6, dans laquelle ladite seconde extrémité de ladite première tige de raccordement (23-1, 143) est raccordée, de manière à pouvoir être sectionnée, au côté de la première barrette transversale (17-1, 37). 5
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8. Pince (11) pourvue de dispositifs de fixation selon la revendication 7, dans laquelle ledit filament flexible (15) est réalisé en forme de U, ledit dispositif de fixation comprenant en outre une seconde barrette transversale (17-2) située sur l'extrémité opposée dudit filament flexible (15). 15
9. Pince (11) pourvue de dispositifs de fixation selon la revendication 8, comprenant en outre un second montant (19-1) et une seconde tige de raccordement (25-2) qui est raccordée, par une première extrémité, audit second montant (19-2) et étant raccordée par une seconde extrémité, de manière à pouvoir être sectionnée, au côté de ladite seconde barrette transversale (17-2). 20
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10. Pince (11) pourvue de dispositifs de fixation selon la revendication 9, dans laquelle ladite première tige de raccordement (25-1) et ladite seconde tige de raccordement (25-2) sont raccordées aux côtés extérieurs respectivement de ladite première barrette transversale (17-1) et de ladite seconde barrette transversale (17-2). 30
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11. Pince (11) pourvue de dispositifs de fixation selon la revendication 10, dans laquelle au moins l'une des barrettes constituées par ledit premier montant (19-1) et ledit second montant (19-2) est pourvue de moyens permettant d'aligner correctement ledit dispositif de fixation à l'intérieur dudit outil (51,101) de fixation du dispositif de fixation. 40
12. Pince (11) pourvue de dispositifs de fixation selon la revendication 11, dans laquelle lesdits moyens d'alignement comprennent une indentation (24) formée le long du côté extérieur d'au moins l'une des barrettes comprenant ledit premier montant (19-1) et ledit second montant (19-2). 45
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13. Outil (51) servant à distribuer des dispositifs individuels de fixation (13) à partir d'une pince (11) pourvue de dispositifs de fixation dans un article désiré, la pince (11) pourvue de dispositifs de fixation comprenant un couple de montants (19-1, 19-2) qui d'une manière générale sont parallèles et un ou plusieurs dispositifs de fixation (13), chaque dispositif de fixation (13) comprenant un filament flexible 55

(15) et un couple de barrettes transversales (17-1, 17-2) disposées à des extrémités opposées de ce filament, le filament flexible (15) étant disposé dans le plan du couple de montants (19-1, 19-2) disposés d'une manière générale en étant parallèles, chaque barrette du couple de barrettes transversales (17-1, 17-2) étant raccordée à un montant correspondant par une tige de raccordement, les tiges de raccordement (23-1, 23-2) étant raccordées, de manière à pouvoir être sectionnées, aux côtés extérieurs de leurs barrettes transversales respectives (17-1, 17-2), ledit outil (51, 101) comprenant :

- a) un corps (53);
- b) un couple d'aiguilles (57-1, 57-2) qui font saillie à partir de l'avant du corps (53), chacune desdites aiguilles (57-1, 57-2) possédant une extrémité avant adaptée pour être insérée dans l'article, un trou longitudinal dimensionné de façon appropriée pour permettre à l'une des barrettes transversales du dispositif de fixation (13) de glisser dans ce trou, ledit perçage longitudinal étant fendu de manière à permettre à l'extrémité du filament (15) adjacente au bord transversal de s'étendre dans ce trou, et une arête de couteau (83) positionnée de façon appropriée sur le côté extérieur de ladite aiguille (57) pour sectionner la tige de raccordement lorsque la barrette transversale passe devant ce couteau; et
- c) un couple de tiges d'éjection (93-1, 93-2) peuvent glisser en va-et-vient à travers lesdites aiguilles (57) et peuvent être actionnées manuellement par une ouverture formée dans l'arrière du corps (53) pour repousser les barrettes transversales (17-1, 17-2) du dispositif de fixation (13) dans et à travers lesdits perçages longitudinaux desdites aiguilles (57), pour leur introduction dans l'article désiré.

14. Outil (51,101) selon la revendication 13, dans lequel ledit corps (53,103) possède une fente, qui s'étend vers le bas à partir de sa partie supérieure en arrière desdites aiguilles (57-1,57-2) et par laquelle la pince (11) pourvue de dispositifs de fixation peut être insérée pour le positionnement des barrettes transversales (17-1,17-2) d'un dispositif de fixation désiré (13) directement en arrière desdits perçages longitudinaux desdites aiguilles (57-1,57-2).

15. Outil (51,101) de fixation d'un dispositif de fixation selon la revendication 14, dans lequel ladite fente et le couple de montants (19-1,19-2) sont pourvus d'éléments d'alignement qui coopèrent et facilitent un alignement correct des barrettes transversales (17-1, 17-2) avec lesdits perçages longitudinaux desdites aiguilles (57-1, 57-2).

16. Outil (51,101) de fixation d'un dispositif de fixation selon la revendication 15, dans lequel lesdits éléments d'alignement coopérants incluent des indentations (24) situées sur les côtés extérieurs des montants (19-1, 19-2) et des barrettes formées sur les parois intérieures correspondantes de ladite fente.

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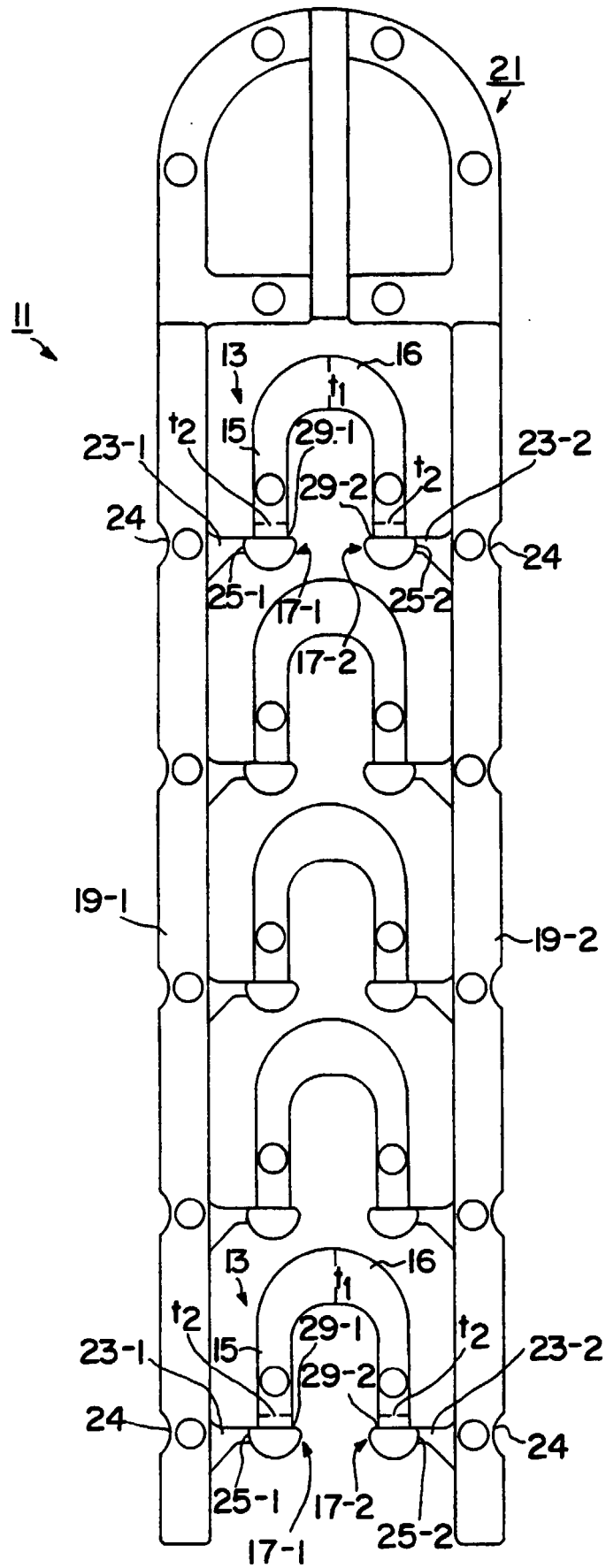


FIG. 1

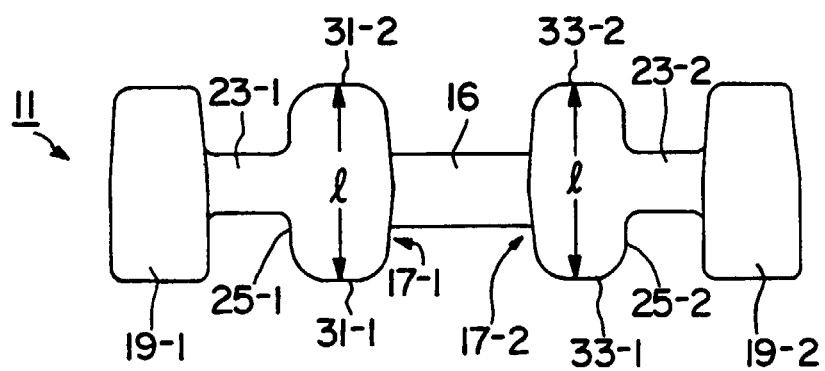


FIG. 2

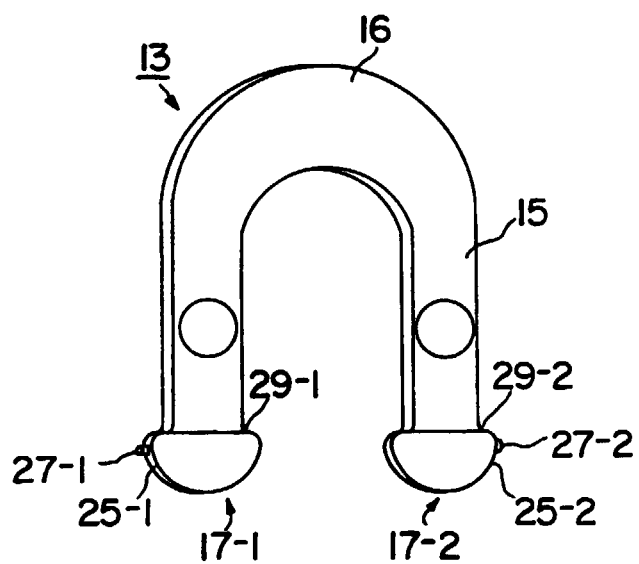
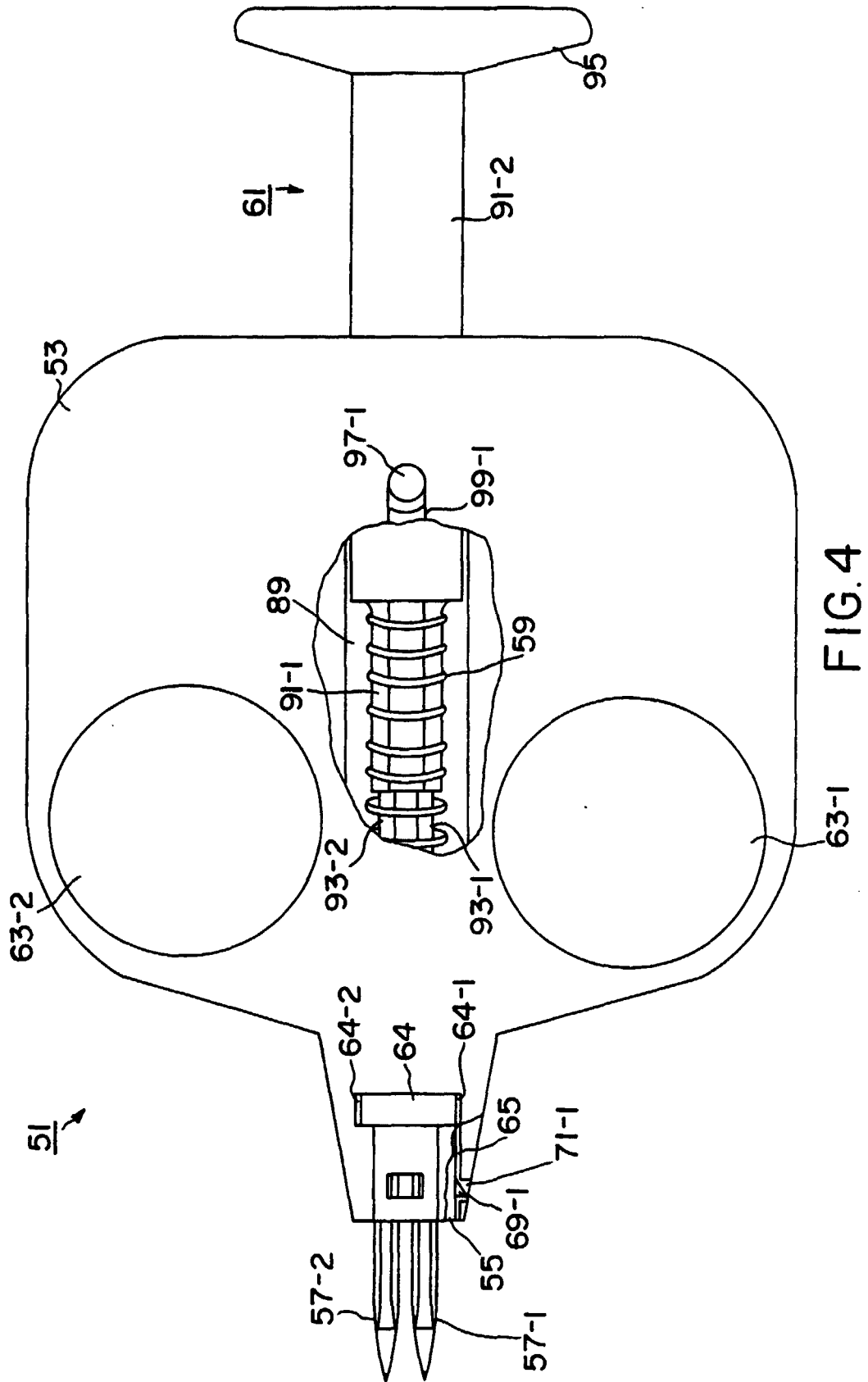


FIG. 3



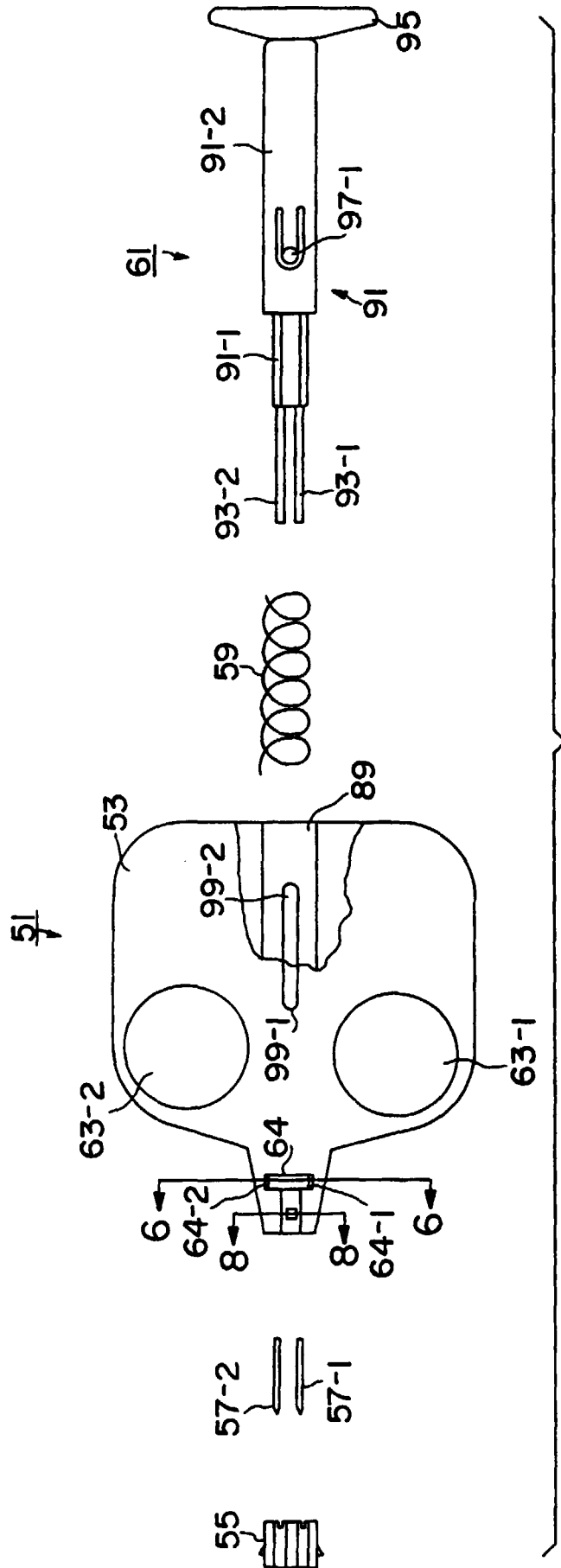


FIG. 5

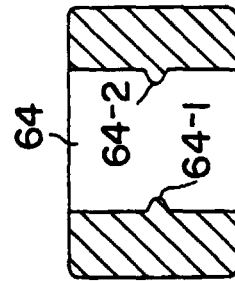
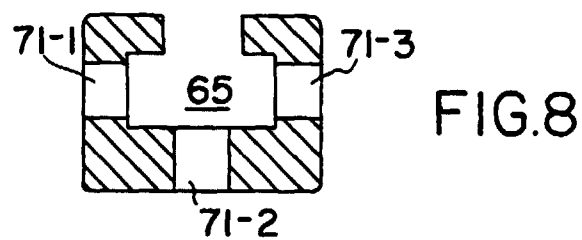
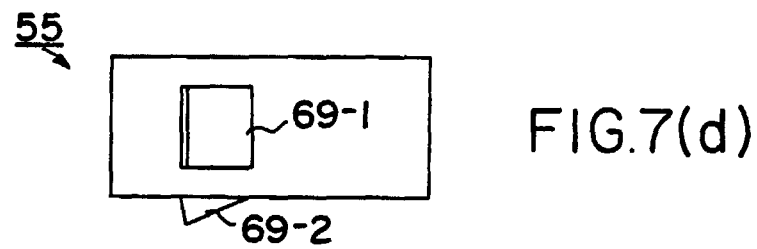
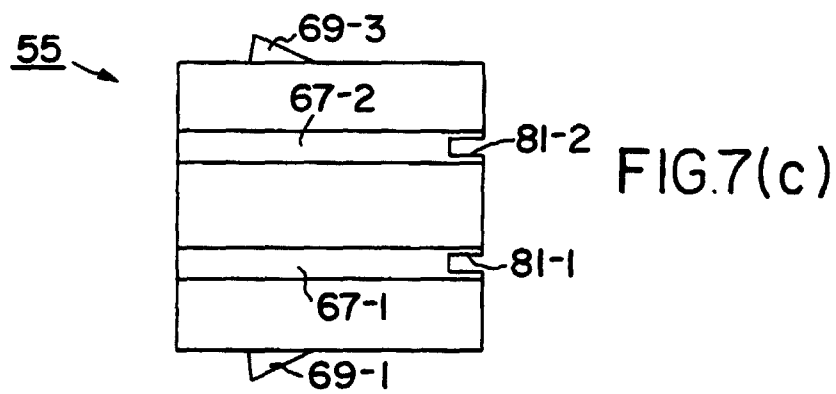
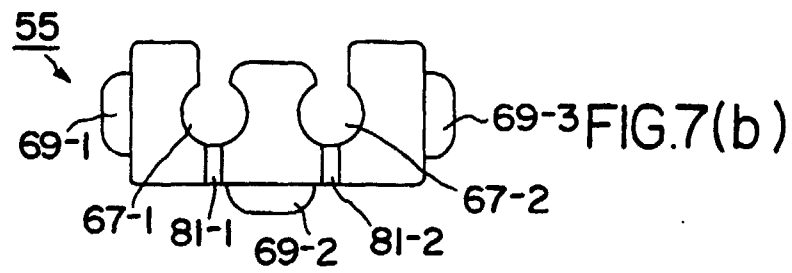
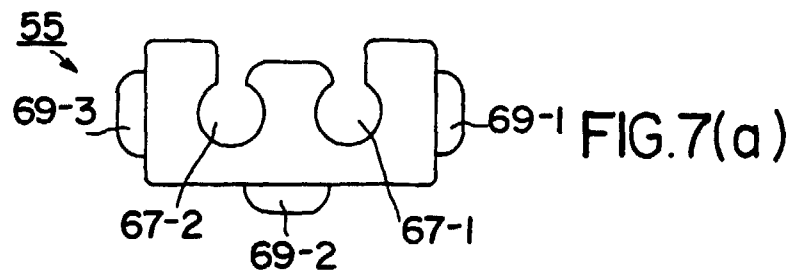
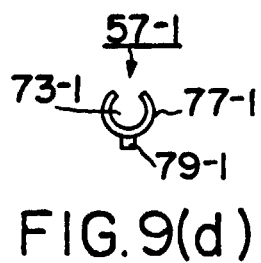
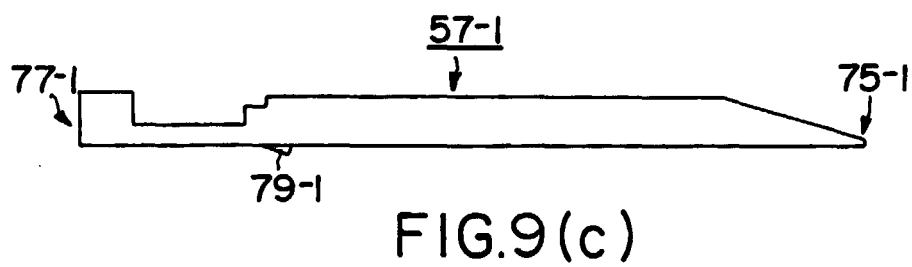
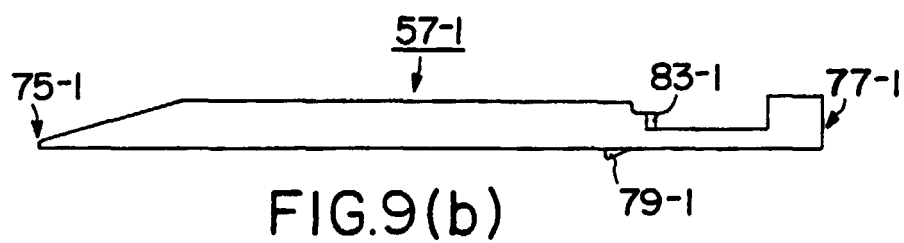
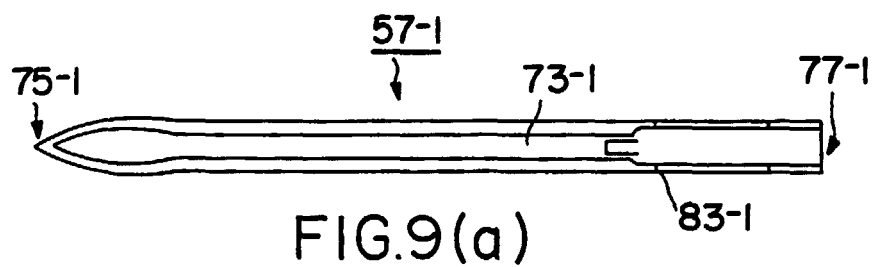


FIG. 6





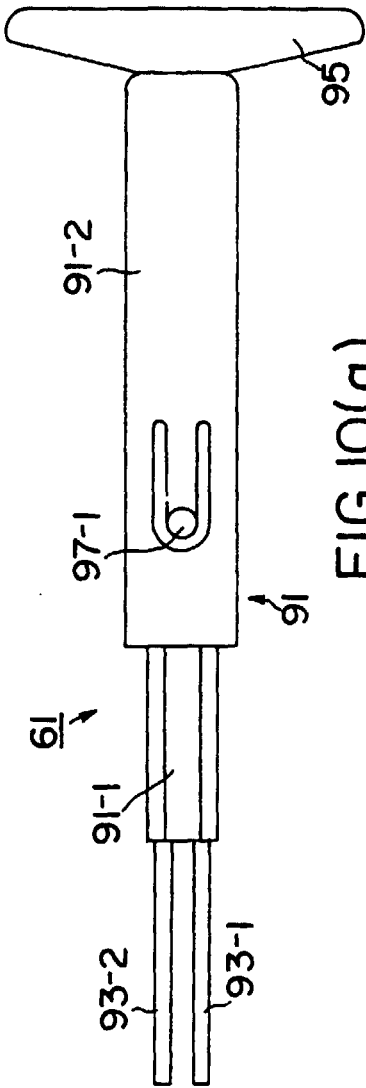


FIG. 10(a)

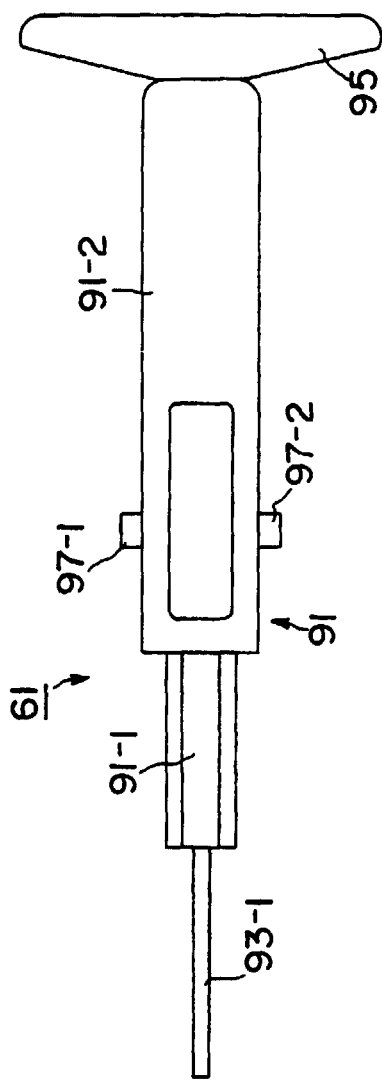
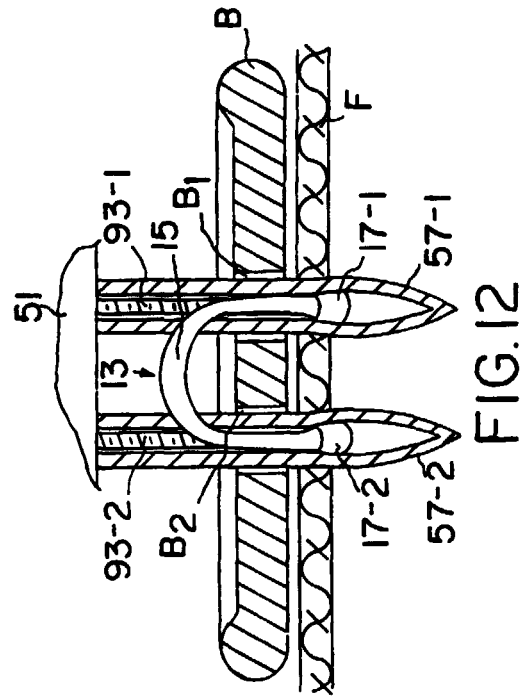
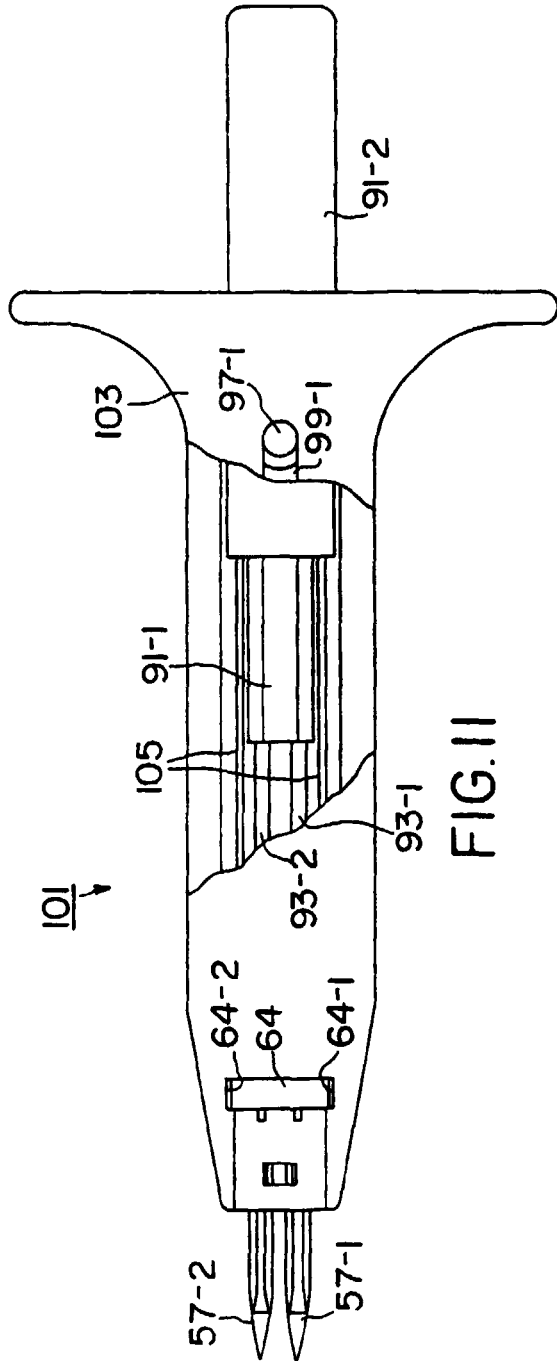


FIG. 10(b)



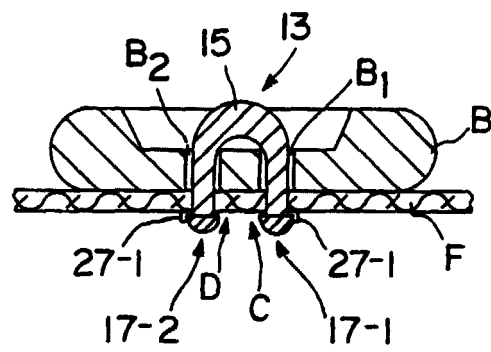


FIG. 13

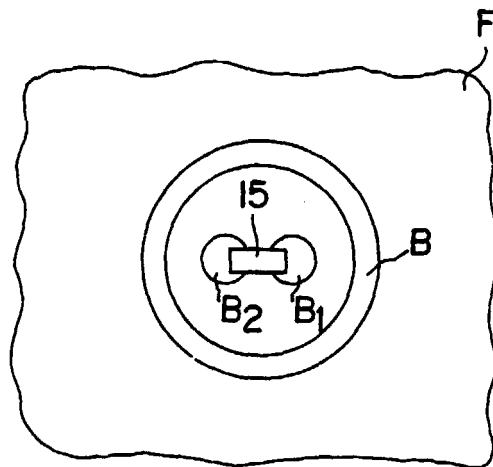


FIG. 14

