

[54] **FASTENER ATTACHMENT INSERTION
DEVICE NEEDLE CONSTRUCTION**

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[52] **U.S. Cl.**..... 112/104, 24/150, 29/235,
29/241, 29/433, 112/125, 223/104, 227/67

[51] **Int. Cl.**..... **D05b 3/12**

[58] **Field of Search** 227/25, 65, 67, 68, 70,
227/71; 24/150; 128/221; 29/433, 450, 451,
235, 241; 212/222, 224; 112/104, 125 X;
223/104 X

[56] **References Cited**

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3,103,666	9/1963	Bone	227/67
3,470,834	10/1969	Bone	227/67 UX
3,598,025	8/1971	Cotton	227/67 X
3,659,769	5/1972	Bone	227/67 UX

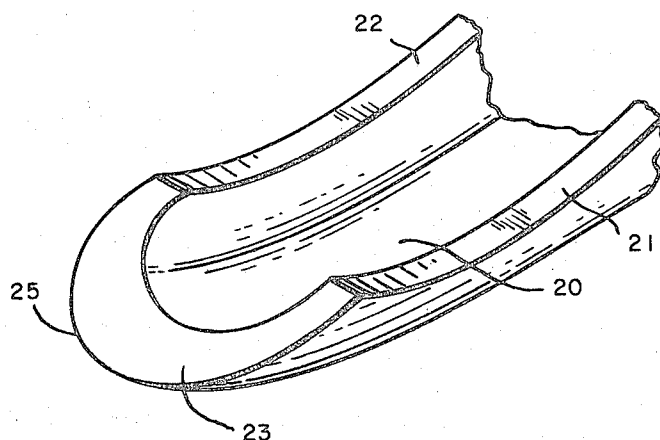
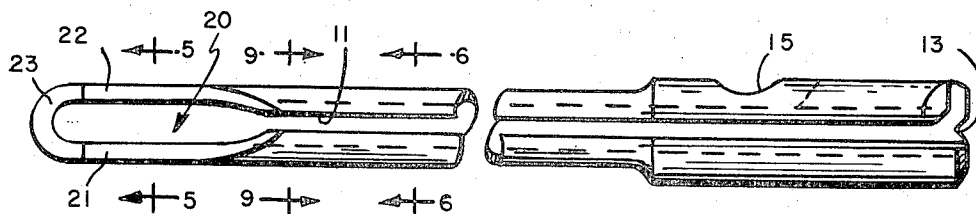
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Cushman & Pfund

[57] **ABSTRACT**

A needle for use in fastener attachment insertion device or the like and which includes a spoon-like end for forming a slit in material such as leather so that one end of a fastener attachment member may be pushed through the needle and then through the slit formed in the material.

3 Claims, 9 Drawing Figures



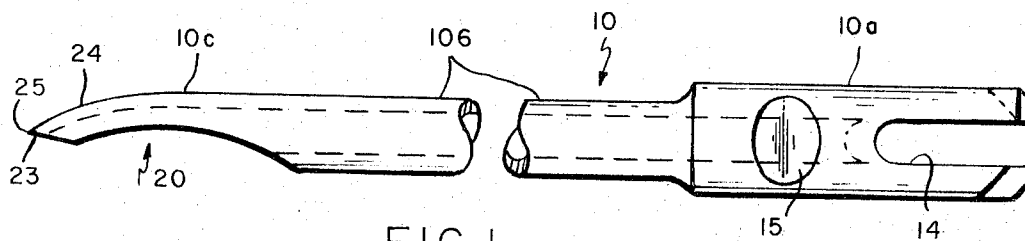


FIG. 1

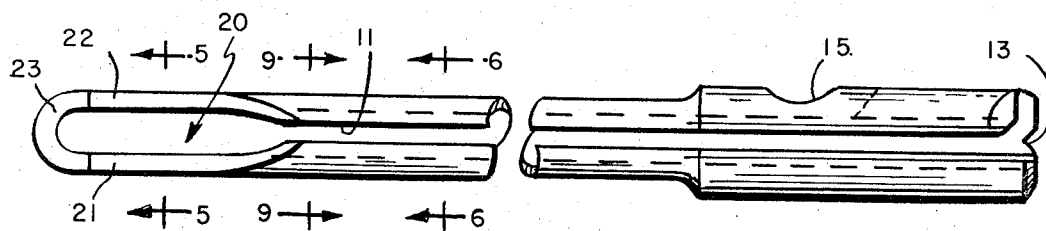


FIG. 2

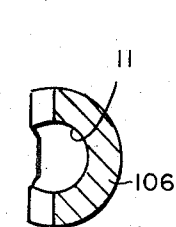


FIG. 5

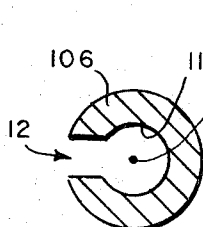


FIG. 6

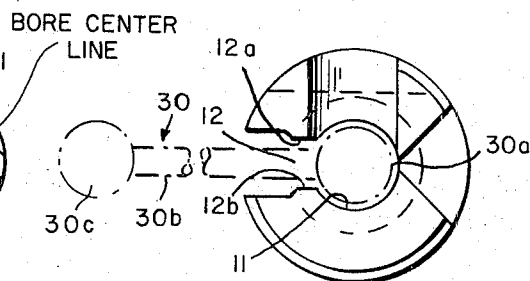


FIG. 3

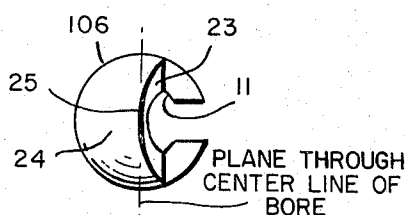


FIG. 4

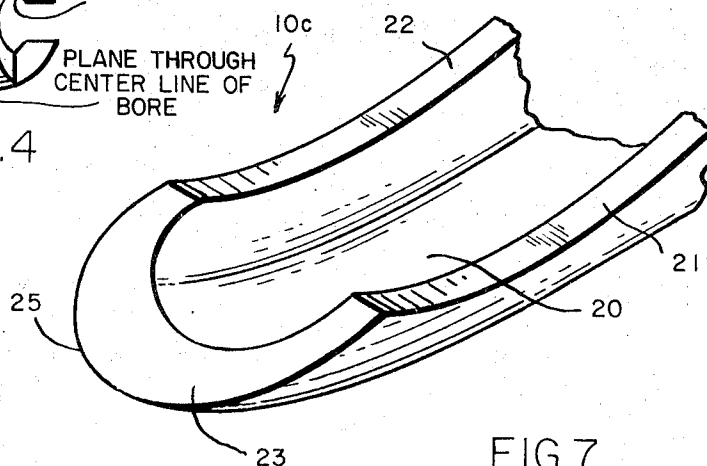


FIG. 7

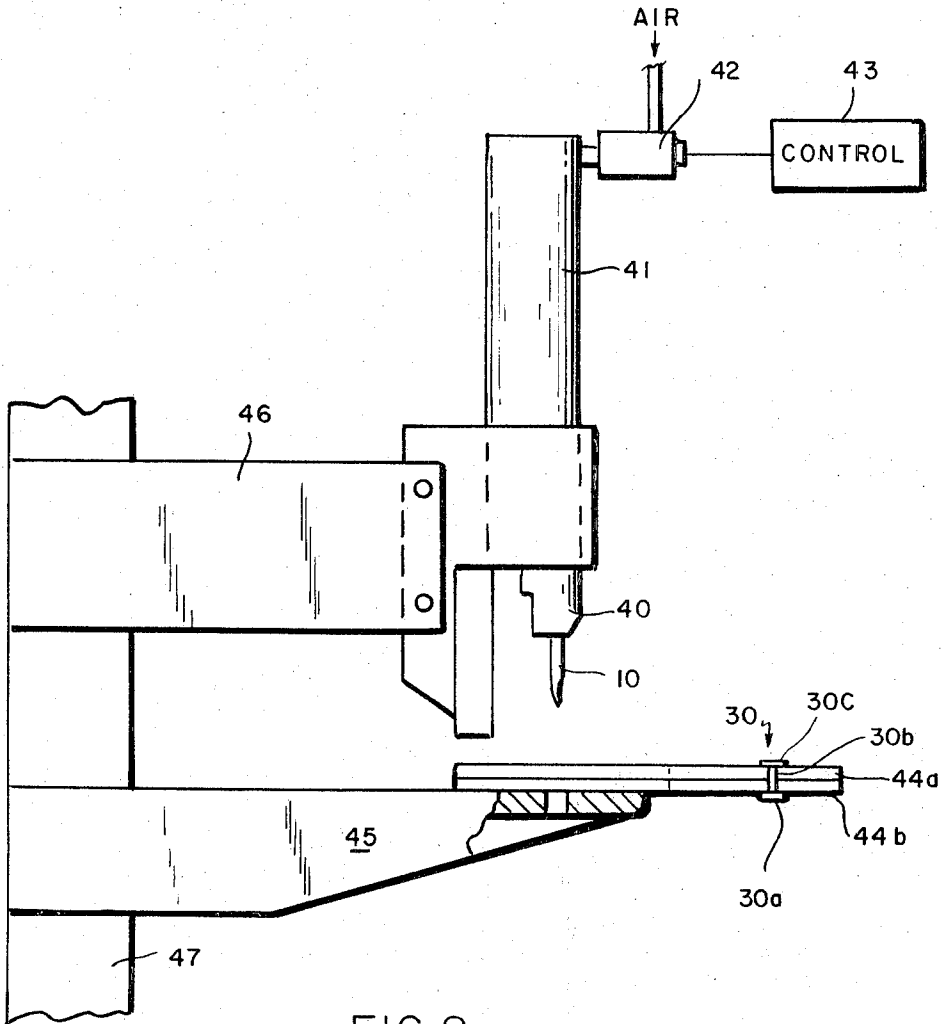


FIG 8

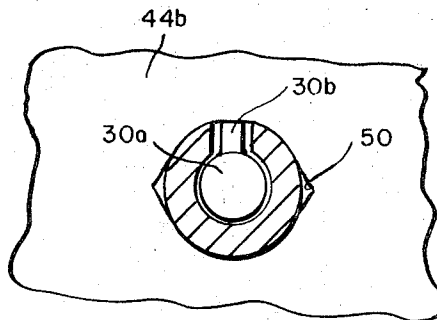


FIG 9

FASTENER ATTACHMENT INSERTION DEVICE NEEDLE CONSTRUCTION

BACKGROUND OF THE DISCLOSURE

This invention relates to devices for inserting fastener attachment members through material or the like and is more particularly directed to a new and improved needle construction for forming a slit in material such as leather which is difficult to stretch and then guiding one end of a fastener attachment member through the material.

As used herein the term needle is meant to include tubes or the like constructed in accordance with the description provided herein.

Devices including needles for inserting fastener attachment members through material and fastener attachment members are illustrated in U.S. Pat. Nos. 3,103,666, 3,444,597, 3,470,834, 3,659,769 and others. The devices and the fastener attachment members find utility in coupling layers of material together or in attaching tags to material.

The aforementioned patents illustrate a conventional substantially cone shaped pointed needle. Although the cone tipped needle is suitable and quite adequate in many situations such as in the piercing of stretchable materials such as cloth, etc., it has been found that needles having this type of tip construction are not completely suitable for making an opening in tough and/or thick substantially unstretchable materials such as leather, plastic or the like to permit the easy passage of a portion of a fastener attachment member there-through.

In particular when the cone tipped needle of the prior art cited on the foregoing page was used in the power tagging devices of the type shown in U.S. Patent Applications Ser. Nos. 147,528 (now U.S. Pat. No. 3,735,908) and 147,529 (now U.S. Pat. No. 3,734,375) both filed on May 27, 1971 and assigned to the same assignee as this application (all of which are incorporated herein by reference hereto) and used to penetrate leather or the like, needle penetration through the material was not always accomplished, needles tended to break and/or bend and the circular opening formed through the material would tend to very often break the filament between the two end bars of the fastener attachment members when the fastener attachment member was forced through the hole formed by the needle in the material.

The disclosures of the aforementioned U.S. patent applications were filed in West Germany, as Application No. P 22 25829.3 and in Holland as Application No. 72 07192 and were laid open for public inspection in West Germany on Nov. 27, 1972 and in Holland on Nov. 29, 1972.

In view of the foregoing a new and improved fastener attachment device needle construction was required to overcome the difficulties encountered with the aforementioned prior art needles.

SUMMARY OF THE DISCLOSURE

The present invention comprises a new and improved fastener attachment insertion device needle construction which includes an elongated line cutting edge for making a slit in the material through which a portion of a fastener attachment member is to be inserted and a spoon-like shaped front end for guiding a portion of the

fastener attachment member after it passes through the slit formed in the material.

In the preferred construction the cutting edge is defined as the line intersection of two side surfaces of the needle end.

BRIEF DESCRIPTION OF THE DRAWINGS

FIGS. 1-4 are respectively top, side, rear-end and front views of the needle of the invention;

FIG. 5 is a sectional view taken along line 5-5 of FIG. 2;

FIG. 6 is a sectional view taken along line 6-6 of FIG. 2;

FIG. 7 is a perspective showing the needle front end;

FIG. 8 shows the needle mounted in a device for inserting a fastener attachment member through layers of material; and

FIG. 9 illustrates a fastener attachment bar and filament passing through the slit formed in material by looking back into the needle in a sectional view taken at 9-9 in FIG. 2 with the portion of the needle forward of line 9-9 extending forward of the material surface after penetrating through the material.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Reference should now be had to FIGS. 1-7 for a description of the preferred embodiment of the invention. The needle 10 comprises a rear mounting portion 10a, a central portion 10b and a front end portion 10c and may be formed from steel by machining or using other conventional forming or shaping techniques.

The needle mounting portion 10a and central portion 10b include a bore 11 extending therethrough with a slot 12 opening into the bore. The spacing between the walls 12a and 12b of the slot being such to prevent an end bar member 30a of a fastener attachment member 30 (see FIG. 3) escaping therefrom while permitting a filament member 30b thereof to extend through the slot.

In FIG. 3 the filament member 30b is also shown coupled to the other end bar 30c outside of the needle bore. The fastener attachment bar end member 30a is pushed through the bore 11 by a plunger (not shown) and exits from the needle when it reaches the needle front end portion 10c where it is no longer confined.

The needle mounting portion 10a preferably includes a knife 13 for cutting the fastener attachment members away from a carrier (not shown) therefore as well as a second slot 14 of a width to permit a portion of the member 30a to be inserted into the needle bore 11 prior to its being separated from a carrier therefore. At 15 the mounting portion is provided with a cutout so that it may be accurately positioned in place within a fastener insertion feeding device such as shown in the aforementioned U.S. Pat. No. 3,659,769 and U.S. Patent application, Ser. No. 158,438, now abandoned.

For a fuller description of the mounting portion and the knife thereof reference may be had to U.S. Pat. No. 3,659,769 as well as to U.S. Patent application Ser. No. 158,438 filed June 30, 1971, now abandoned, (the disclosure of this application being incorporated herein by reference hereto).

The corresponding foreign patent application was filed in West Germany on June 30, 1972 as Application No. P 22 32 215.2 and was laid open for public inspection after Dec. 30, 1972; and was filed in Holland on

June 29, 1972 as Application No. 7209019 and was laid open for public inspection on Jan. 3, 1973.

The front end portion 10c is spoon shaped and comprises a wide open channel or spoon shaped hollow 20 defined by side surfaces 21, 22 and 23 and from which the fastener attachment member bar 30a is ejected from the needle.

The flat side surface 23 and the opposite curved side surface 24 of the front end portion 10c intersect and define a line 25 which forms an elongated line cutting or knife edge other than a point for producing a slit 50 in leather or the like as the needle is driven into leather or the like.

Reference should now be had briefly to FIG. 8 which illustrates a device for carrying and supporting the needle 10 of the present invention and forcing it through the material. FIG. 8 is essentially FIG. 26 in the aforementioned patent application Ser. No. 147,528, 147,528 now Patent Number 3,735,908, and patent application Ser. No. 147,529, now U.S. Pat. No. 3,734,375, and comprises a telescoping member 40 positioned in a cylinder 41. The telescoping member 40 is controlled by a valve 42 controlled via control means 43.

The opening valve 42 propels the telescoping member 40 and needle 10 downwardly through two layers of material 44a and 44b supported by a frame member 45. The cylinder 41 is supported by a frame member 46 which is coupled to frame member 47 as is frame member 45.

A clamp (not shown) may also be included which is also driven forward with the telescoping member to clamp the material 44a and 44b against the frame 45. At the right of FIG. 8 the fastener attachment member 30 is shown holding the layers of material 44a and 44b together. For a further description of the operation of the device of FIG. 8 reference should be had to the aforementioned patent applications which are incorporated herein.

Reference should now be had to FIG. 9 which shows the needle positioned in the slit 50 formed by the cutting edge 25 and illustrating the portions 30a and 30b of the fastener attachment member being forced through the slit 50 of the material 44b by a plunger (not shown) pushing the bar 30a through the needle 10.

In the preferred construction the plane of the flat surface 23 is preferably positioned at a right angle with re-

spect to the center line of the bore 11 and the line knife edge also preferably intercepts or passes through the center line of the bore (if carried forward). The plane of the flat surface 23 is also preferably at an angle of 90° with respect to the slot walls 12a and 12b. It should also be noted that the walls of the slit 50 engages filament member 30b as the bar member 30a is pushed through the elongated slit with one of the slit walls preferably ninety degrees with respect to the filament where the bar 30a is pushed through the slit against it.

With the construction of the needle of this invention, there are significant economies in manufacture. The present needle construction lends itself to being formed from a cylindrical tube by cutting off a portion of one end of the tube, then bending the tip of the tube, and then producing the flat surface 23 to provide the cutting edge 25.

I claim:

1. In a fastener attachment member insertion device needle for inserting fastener attachment members into material, the needle including a tubular member having a mounting portion, a central portion and a front end portion, at least the central portion having a bore and a longitudinal slot along one side of the bore, the distance between the surfaces defining the slot less than the diameter of the bore, the improvement comprising a needle tip having a spoon-like hollow forward of the bore for expelling the fastener attachment member with the forward most tip portion defining a line knife edge to form an elongate slit in material upon insertion into the material, said line knife edge being a curved line and said line knife edge defined by a curved side surface and a flat side surface intersecting the curved side surface, said spoon-like hollow portion having a curved open channel defined between spaced curved side surfaces and said flat surface, which intersects said spaced curved side surfaces at the front of the channel, and said spaced curved side surfaces also intersecting surfaces defining said slot at the rear of said channel.

2. In the needle of claim 1 in which the curved side surface defining the knife edge comprises more than half the tip when the needle is viewed in a front view.

3. In the needle of claim 2 in which the line knife edge passes through an extended center line of the bore of the central portion.

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