Dec. 6, 1966 J. J. CAHILL 3,289,509

REINFORCEMENT APPLICATOR

Filed Jan. 13, 1965

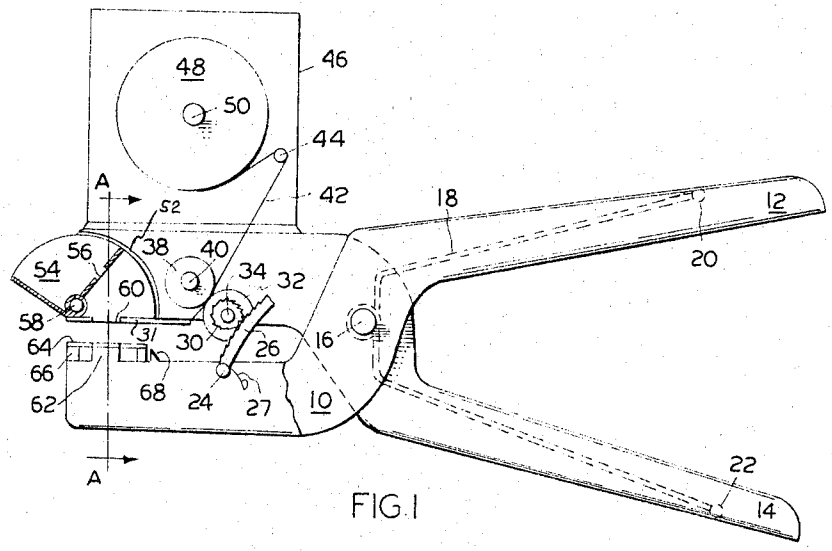


FIG. 1

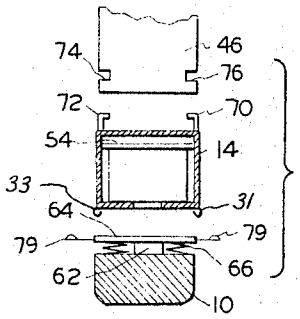


FIG. 2

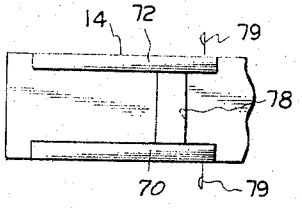


FIG. 3

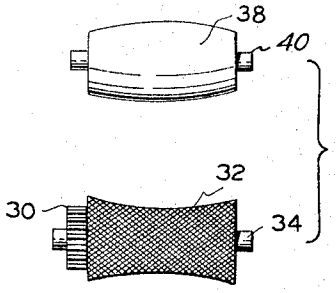


FIG. 4

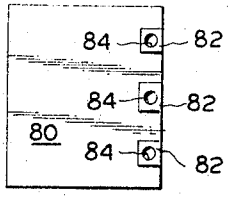


FIG. 5

INVENTOR
JOHN J. CAHILL

BY Eugene M. Bond
ATTORNEY

United States Patent Office

3,289,509

Patented Dec. 6, 1966

3,289,509

REINFORCEMENT APPLICATOR

John J. Cahill, Roatke Road, R.D. 1, Shongum Lake, Dover, N.J.

Filed Jan. 13, 1965, Ser. No. 425,327
4 Claims. (Cl. 83—140)

This invention relates to a pressure-sensitive reinforcement tape applicator. More particularly, the present invention relates to a pressure-sensitive reinforcement tape applicator of the type wherein individual sections of tape may be dispensed, secured and simultaneously punched with a hole through both the secured tape and the sheet.

It is often desirable to punch a hole in a sheet and to thereafter reinforce the punched hole with an adhesive eyelet. Such practice heretofore has been accomplished by manually applying individual eyelets to each punched hole, resulting in a procedure which is excessively time consuming. Accordingly, reinforcement applicators have been developed wherein complicated devices perform such procedures mechanically. However, where complicated devices have been employed, it is known that these devices often jam and become inoperative. It has now been found by the practice of the present invention that an inexpensive hole punch and tape applicator may be prepared which overcomes many of the problems encountered heretofore in the art.

It is an object of this invention, therefore, to provide a reinforcement applicator for installing pressure-sensitive tape simultaneously upon punching a hole in a sheet to which the tape is applied.

It is also an object of this invention to prove a reinforcement applicator useful and dependable in operation and very simple and economical in construction.

It is a further object of this invention to provide a new and novel hole-punch which simultaneously applies a reinforcement strip of pressure-sensitive tape and which is easily loaded in an expeditious manner.

It is another object of this invention to provide a reinforcement applicator which is hand operated and which provides substantially uniform advancing movement of associated pressure-sensitive tape, and which severs the tape from a substantially continuous supply in a positive and accurate manner.

The reinforcement applicator of the present invention overcomes disadvantages in complex applicator mechanisms known heretofore by application of a hand operated punch which conveniently advances a pre-determined length of pressure-sensitive tape over the area of a sheet to be punched and simultaneously applies a length of tape to the sheet and punches a hole therein. The reinforcement applicator of the present invention is especially provided with a pressure-sensitive tape advancing means including cooperative means for severing the advanced length of tape from a substantially continuous supply removably attached to the applicator.

When utilizing the present reinforcement applicator, the several elements thereof specifically cooperate to sequentially advance and cut, at substantially the same length, tape to be applied over an area of a sheet to be punched with a hole. The strip of tape, accurately and neatly cut at the proper length from a substantially continuous supply, is then applied with pressure to the sheet which is being punched with a hole. The present reinforcement applicator is also provided with a removable tape supply means which is conveniently and quickly reloaded when the supply is exhausted, thereby further overcoming disadvantages in prior apparatus wherein individual eyelets must be loaded into the applicator.

The novel application of the present invention includes a hollow body portion formed of a first lower handle near

one end thereof and a hollow body portion similarly formed of a second upper handle pivotally connected together at a convenient position of the applicator. A hole punching means is provided in the body portions which operate upon pivotal movement of the handle portions toward one another. Resilient means normally urge the first and second handles apart in normal position. During the punching operation tape is advanced by an advancing means mechanically engaged with at least one of said handle portions and positioned for operation in the opposite handle. After the application of tape and the punching of a hole is completed, the various elements, excluding the unidirectionally advanced tape, return to normal position in preparedness for a subsequent operation.

Two cooperative members are provided for severing the advanced tape and for supporting the tape prior to application of a pre-determined length of tape to a sheet. The length of tape applied to the sheet may be conveniently regulated simply by regulation of the tape advancing means.

Additional objects, advantages and features of this invention residing in the particular construction, combination of elements and arrangement of parts will become more apparent in the following detailed description.

In the drawings:

FIG. 1 is a side elevation view having sections removed indicating the internal construction of the present applicator;

FIG. 2 is a cross-sectional view, taken substantially on the plane of line A—A of FIG. 1, and illustrating the forward portions of the applicator;

FIG. 3 is a partial elevational view of the applicator illustrating the cartridge retaining rails;

FIG. 4 is a front elevational view showing the pressure-sensitive tape advancing means; and

FIG. 5 illustrates the front elevational view of a sheet having applied reinforcement tape in place about punched holes.

Referring to the drawings in which like numbers represent like elements in the several views, FIG. 1 shows reinforcement applicator 10 in normal position as it may appear, having upper handle assembly 12 and lower handle assembly 14 pivotally mounted about pin 16 securing spring 18 therebetween to form a pair of grips. Spring 18 may be further provided with ball ends 20 and 22, respectively, to prevent jamming or excessive wear of the spring on the respective handles. The forward portion of handle 12 contains pin 24 securing advancing banana gear 26 held in position by spring 27 for engagement with gear 30 of lower advancing roll 32 secured to the forward portion of handle 14 by pin 34.

Connected to handle 14, forward of lower advancing roll 32, is a mating roll 38 about securing pin 40. Pressure-sensitive tape 42 is advanced on the non-adhesive side about guide pin 44, within housing 46, from supply roll 48 about pin 50. The tape is advanced into operating position by rolls 32 and 38 where it is held in position by C-rails 31 and 33, shown more clearly hereinafter. The housing 46 is removably secured to rails (shown in detail hereinafter) on the top portion of handle 14 and is desirably formed of a suitable and inexpensive plastic.

Within handle 14, below secured housing 46, there is further provided a retaining plate 52, within which surplus receiving chamber 54 receives cut-outs through slot 56. Surplus receiving chamber 54 is pivotally mounted about pin 58 to provide means for easily removing the surplus material accumulated therein as received through punch hole 60 of handle 14.

Within handle 12 there is provided punch 62 below plate 64 supported by spring 66. Tape cut-off blade 68 is conveniently disposed on arm 12 to sever the applied tape

at any desirable length. Although blade 68 is shown fixed, it is recognized that the blade may be mounted on a moveable element to regulate the length of the severed tape as desired.

FIG. 2 further illustrates the invention and indicates the manner by which housing 46 may be secured to the top of handle 14 by cut-outs 74 and 76 which slide onto rails 72 and 70, respectively. C-rails 31 and 33 are further provided to hold tape 42 in position over punch 62.

FIG. 2 further illustrates sheet retaining means 79 to limit the extent a sheet to be punched iwll be received in the applicator.

FIG. 3 illustrates a partial elevational view of the forward portion of handle 14. Slot 78 in handle 14, located between rails 70 and 72, receives tape 42 from housing 46.

FIG. 4 illustrates mating rolls 32 and 38 on pins 34 and 40 centrally disposed therein. Gear 30 in pin 34 of roll 32 is driven by banana gear 26 as illustrated in FIG. 1. The important feature of the present invention resides, in part, in rolls 32 and cooperating roll 38. As shown in FIG. 4, roll 32 is embossed and perfectly constructed from a suitable material such as those which will not adhere to pressure-sensitive tapes. An example of a preferred material for use herein is that sold under the trade name Mylar by Du Pont. Embossed roll 32 is desirably formed as a concave roll to provide adequate advancing pressure on the tape and is mated with smooth roll 38 desirably formed of soft plastic, rubber or soft co-polymeric materials such that embossed roll 32 adequately grips tape 42 therebetween.

FIG. 5 illustrates sheet 80 which may be paper, cardboard, thin plastic or the like which pressure-sensitive tape 42 may adhere as strips 82 about punched holes 84.

It is to be understood that the foregoing detailed description is given merely by way of illustration and that many variations may be made therein without departing from the spirit and scope of the present invention.

What is claimed is:

1. A pressure-sensitive tape applicator and hole punch which comprises a hollow body forward lower handle portion, a hollow body forward upper handle portion, said upper and lower handle portions pivotally mounted and extending rearwardly therefrom and forming a pair of hand grips, spring means within said hand grips, pressure-sensitive tape supply means removably secured to said forward upper handle portion, tape advancing means within said forward upper handle portion and mechanically operated by gear means secured to said lower handle portion, an anvil plate enclosing a plunger slidable through said anvil plate and forming lower hole punch means on said lower handle portion, a plunger receiving hole mounted on said upper handle portion, tape guide means mounted between said receiving hole and said plunger, a tape cutting blade mounted rearwardly of said anvil plate, spring means urging said anvil plate to a normal horizontal level above said tape cutting blade and said plunger, and sheet stop means disposed adjacent to said tape cutting blade whereby the tape is cut along the edge of a sheet received within the applicator.

2. A pressure-sensitive tape applicator and hole punch which comprises a hollow body forward lower handle portion, a hollow body forward upper handle portion, said upper and lower handle portions pivotally mounted and extending rearwardly therefrom and forming a pair of hand grips, spring means within said hand grips, pressure-sensitive tape supply means removably secured to said forward upper handle portion, tape advancing rolls within said forward upper handle portion and mechanically operated by gear means secured to said lower handle portion, an anvil plate enclosing a plunger slidable through said anvil plate and forming lower hole punch means on said lower handle portion, a plunger receiving hole mounted in said upper handle portion, C-rail tape guides mounted on said upper handle portion for receiving tape between said receiving hole and said plunger, a tape cutting blade mounted rearwardly of said anvil plate, spring means urging said anvil plate to a normal horizontal level above said tape cutting blade and said plunger, and sheet stop means disposed adjacent to said tape cutting blade whereby the tape is cut along the edge of a sheet received within the applicator.

3. A pressure-sensitive tape applicator and hole punch which comprises a hollow body forward lower handle portion, a hollow body forward upper handle portion, said upper and lower handle portions pivotally mounted and extending rearwardly therefrom and forming a pair of hand grips, spring means within said hand grips, pressure-sensitive tape supply means removably secured to said forward upper handle portion, a first tape advancing roll, a second concave tape advancing roll mating with said first roll, said first roll formed of soft rubber and said second roll formed of embossed tape non-adhering material, gear means secured to said lower handle portion and mechanically engaging said second roll, and anvil plate enclosing a plunger slidable through said anvil plate and forming lower hole punch means on said lower handle portion, a plunger receiving hole mounted in said upper handle portion, C-rail tape guides mounted on said upper handle portion for receiving tape between said receiving hole and said plunger, a tape cutting blade mounted rearwardly of said anvil plate, spring means urging said anvil plate to a normal horizontal level above said tape cutting blade and said plunger, and sheet stop means disposed adjacent said tape cutting blade whereby the tape is cut along the edge of a sheet received within the applicator.

4. A pressure-sensitive tape applicator and hole punch which comprises a hollow body forward lower handle portion, a hollow body forward upper handle portion, said upper and lower handle portions pivotally mounted and extending rearwardly therefrom and forming a pair of hand grips, spring means within said hand grips, pressure-sensitive tape supply means removably secured to said forward upper handle portions, a first convex tape advancing roll, a second concave tape advancing roll mating with said first roll, said first roll formed of soft rubber and said second roll formed of embossed tape non-adhering material, gear means secured to said lower handle portion and mechanically engaging said second roll, an anvil plate enclosing a plunger slidable through said anvil plate and forming lower hole punch means on said lower handle portion, a plunger receiving hole mounted in said upper handle portion, a pivotal surplus punch material receiving chamber disposed above said plunger receiving hole in said upper handle portion, C-rail tape guides mounted on said upper handle portion for receiving tape between said receiving hole and said plunger, a tape cutting blade mounted rearwardly of said anvil plate, spring means urging said anvil plate to a normal horizontal level above said tape cutting blade and said plunger, and sheet stop means disposed adjacent said tape cutting blade whereby the tape is cut along the edge of a sheet received within the applicator.

References Cited by the Examiner

UNITED STATES PATENTS

2,353,232	7/1944	Greene	156—513 X
2,441,821	5/1948	Kendall	156—513 X
3,226,283	12/1965	Villalon	156—522

WILLIAM W. DYER, JR., *Primary Examiner.*

J. M. MEISTER, *Assistant Examiner.*