July 29, 1969 J. J. CAHILL 3,457,815

REINFORCEMENT APPLICATOR

Filed Aug. 10, 1966

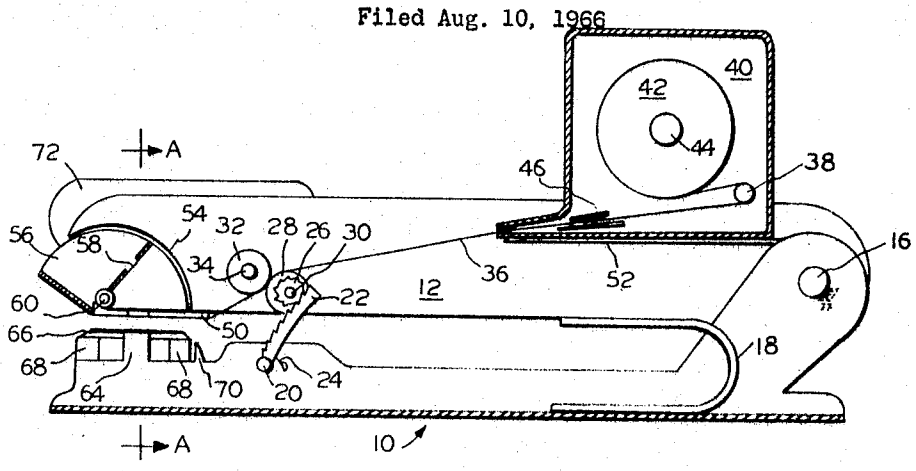


FIG.1

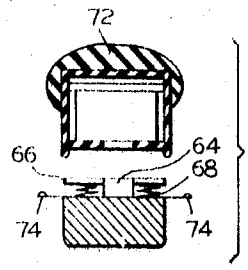


FIG.2

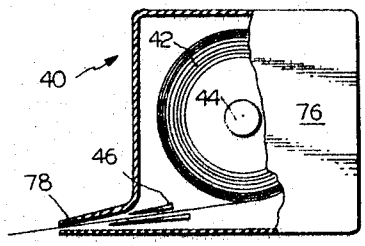


FIG.3

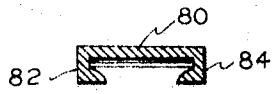


FIG.4

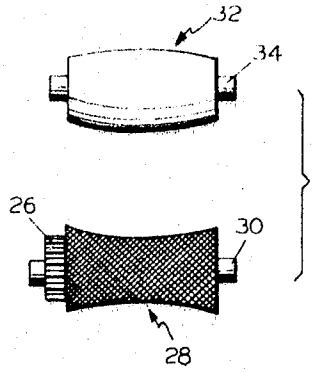


FIG. 5

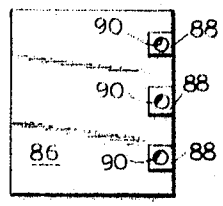


FIG.6

INVENTOR
JOHN J. CAHILL

BY Eugene M. Bond

ATTORNEY

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REINFORCEMENT APPLICATOR

John J. Cahill, Radtke Road, RDI, Shongum Lake, Dover, N.J. 07801

Continuation-in-part of application Ser. No. 425,327, Jan. 13, 1965. This application Aug. 10, 1966, Ser. No. 571,457

The portion of the term of the patent subsequent to Dec. 6, 1983, has been disclaimed

Int. Cl. B26d 7/06, 7/00; B32b 31/00

U.S. Cl. 83—140 7 Claims

ABSTRACT OF THE DISCLOSURE

A desk-type pressure-sensitive tape applicator and hole punch is disclosed having upper and lower handle assemblies with pivotal means therebetween and a pressure-sensitive tape supply removably secured to the upper handle assembly. Tape advancing, cutting, and hole punch means are provided within the assemblies such that tape from the tape supply is advanced and cut along an edge of a sheet during the hole punching operation.

This application for U.S. Letters Patent is a continuation-in-part of application Ser. No. 425,327, filed Jan. 13, 1965, and now U.S. Patent No. 3,289,509.

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 inoperable. 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 provide 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 desk-type 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 portable 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.

It is a further object of this invention to provide a removable supply canister containing reinforcement pressure-sensitive tape which is easily attached to the reinforcement applicator of the present invention.

The reinforcement applicator of the present invention overcomes disadvantages in complex applicator mechanisms known heretofore by application of a portable desk-type punch which conveniently advances a predetermined 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 is accurately and neatly cut at the proper length from a substantially continuous supply, as the tape is 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 of tape is exhausted, thereby further overcoming disadvantages in prior apparatus wherein individual eyelets must be loaded into the applicator.

The novel applicator of the present invention includes a lower body portion formed of sheet material as an elongated base, and a similarly formed upper body portion appearing as an elongated head with pivotal connecting means at a convenient position near one end thereof at a position joining the lower body portion with the elongated head.

A hole punching means is provided in the body portions of the elongated head and elongated base portions and operates upon pivotal movement of the elongated head and base portions toward one another. Resilient means normally urge the elongated head and base portions apart to normal position. During the punching operation, tape is advanced by a tape advancing means mechanically engaged with at least one of the elongated members and positioned for operation in the opposite elongated member. After the application of tape and the punching of a hole are completed in a sheet, 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 predetermined 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 an elevational view, taken in partial section, of the tape canister;

FIG. 4 is a front elevational view illustrating tape retaining C-rails which may be included as an element of the tape canister of FIG. 3 and as tape guide means near the area of the apparatus where the tape is severed;

FIG. 5 is a front elevational view showing the pressure-sensitive tape advancing means; and

FIG. 6 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 desk-type reinforcement applicator **10** in normal position as it may appear, having upper elongated handle assembly **12** and lower elongated base handle assembly **14** pivotally mounted about traverse extending pin **16**. Spring **18** is included between assembly members **12** and **14** to retain the members in normal position. The forward portion of base handle assembly **14** contains pin **20** securing advancing banana gear **22** held in position by spring **24** for engagement with gear **26** of lower advancing roll **28** which roll is secured to the forward portion of upper elongated handle assembly **12** by axle **30**. Alternately, banana gear **22** may be permanently secured in operating position to base assembly **14**.

Connected to upper elongated handle assembly **12**, forward of lower advancing roll **28**, is mating roll **32** about securing axle **34**. Pressure-sensitive tape **36** is advanced on the non-adhesive side about guide pin **38**, within canister **40**, from supply roll **42** about shaft **44**. The tape is advanced into operating position by rolls **28** and **32** where it is held in position by C-shaped rails **46** within the canister and by similar rails **50** adjacent a punch plunger receiving hole described hereinafter. Canister **40** is removably secured to upper elongated handle assembly **12** and is supported on platform **52** by any suitable means such as by friction fit, by clamp or pin-insert means. The canister is desirably formed of a suitable and inexpensive plastic which may be discarded after use.

Within upper elongated handle assembly **12**, there is provided retaining plate **54**, within which surplus receiving chamber **56** receives cut-outs through punch plunger receiving hole **58**. Surplus receiving chamber **56** is pivotally mounted about chamber pin **60** to provide means for easily removing the surplus material accumulated therein as received through punch hole **62**.

Within base handle assembly **14** there is provided punch **64** below anvil plate **66** supported by spring **68**. Tape cut-off blade **70** is conveniently disposed on base handle assembly **14** to sever the applied tape at any desirable length. Although blade **70** is illustrated in fixed position, it is recognized that the blade may be mounted on a movable element to regulate the length of the severed tape as desired.

At one end of upper elongated handle assembly **12**, there is provided, if desired, a suitable pressure pad **72** whereby the members **12** and **14** may be conveniently operated. The pressure pad may be formed of foam rubber, plastic or the like.

FIG. 2 further illustrates the invention and indicates the manner by which sheet retaining means **74** limits the extent a sheet to be punched will be received in the applicator.

FIG. 3 illustrates a partially broken elevational view of canister **40** having enclosing housing **76**. Rails **46** located within the canister usefully guide tape through tape exit port **43**, to the tape advancing mechanism of the reinforcement applicator. Rails **46** may either appear as an extending lip **78** of canister **40** or may appear within the body of the canister in which instance lip **78** may be removed if desired.

FIG. 4 further illustrates the C-rail tape guide **46** which may be employed within canister **40** of FIG. 3. The tape guide is illustrated with a connecting surface **80** joining each rail **82** and **84**. Alternately, the rails may be secured as individual elements to the side walls of the canister or may also appear near the front section of the applicator as rails **50** near the tape cut-off area.

FIG. 5 illustrates mating rolls **28** and **32** on axles **30** and **34** centrally disposed therein. Gear **26** on roll **28** is driven by banana gear **22** as illustrated in FIG. 1. The important feature of the present invention resides, in part, in roll **28** and cooperating roll **32**. As shown in FIG. 4, roll **28** is embossed and constructed from a suitable material such as those which will not effectively adhere to pressure-sensitive tape. An example of a material for use herein is polyethylene terephthalate such as that sold under the trademark "Mylar" by the Du Pont Company. Similar materials such as Du Pont's fluorocarbon plastics, trademarked as "Teflon," or the like may also be employed. Embossed roll **28** is desirably formed as a concave roll to provide adequate advancing pressure on the tape and is mater with smooth roll **32** desirably formed of a rubbery material such as soft plastic, foam or elastic rubber or soft, pliable co-polymeric materials such that embossed roll **28** adequately grips tape **36** therebetween. Roll **32** may, if desired, be positioned on a pivotal element to remove the roll from operating position and permit initial treading of the tape in the unit.

FIG. 6 illustrates sheet **86** which may be paper, cardboard, thin plastic or the like to which pressure-sensitive tape **36** may adhere as strips **88** about punched holes **90**.

Although the present invention has been described as a single portable desk-type unit, it is recognized that two, three or more units may be united for single operation such that a multiple number of holes may be punched in a sheet on a single pivot by a multiple number of units. For example, three reinforcement applicators may be joined to operate together and to punch and reinforce three holes punched simultaneously in a sheet. Multiple units may be at fixed distances from each other or may be constructed to be laterally movable relative to one another as desired.

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, an upper elongated handle assembly, a lower elongated base handle assembly, said upper and lower assemblies pivotally mounted near one end thereof, spring means between said upper and lower assemblies, pressure-sensitive tape supply means removably secured to said upper elongated handle assembly, tape advancing means within said upper elongated handle assembly and mechanically operated by gear means secured to said lower elongated base handle assembly, an anvil plate enclosing a plunger slidable through said anvil plate and forming lower hole punch means on said lower handle assembly, a plunger receiving hole mounted on said upper handle portion, tape guide means mounted adjacent said plunger receiving hole, 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. The pressure-sensitive tape applicator and hole punch of claim **1** wherein said tape guide means mounted adjacent said plunger is C-shaped tape guides.

3. The pressure-sensitive tape applicator and hole punch of claim **1** wherein said tape advancing means comprises in combination a first concave tape advancing roll and a second tape advancing roll mating with said first roll, said second roll formed of soft rubber-type material and said first roll formed of embossed tape non-adhering material.

4. A pressure-sensitive tape applicator and hole punch which comprises, an upper elongated handle assembly, a lower elongated base handle assembly, said upper and lower assemblies pivotally mounted near one end thereof, spring means between said upper and lower assemblies, pressure-sensitive tape supply means removably secured to said upper elongated handle assembly, a first convex tape advancing roll, a second concave tape advancing roll mating with said first roll, said first roll formed of a soft rubbery material and said second roll formed of

embossed tape non-adhering material, gear means secured to said lower elongated base handle assembly 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 elongated base handle assembly, a plunger receiving hole mounted in said upper elongated handle assembly, a pivotal surplus punch material receiving chamber disposed above said plunger receiving hole in said upper elongated handle assembly, C-rail tape guides mounted on said upper elongated handle assembly 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, said sheet stop means disposed adjacent said tape cutting blade whereby the tape is cut along the edge of a sheet material received within the applicator.

5. A pressure-sensitive tape applicator and hole punch which comprises, an upper elongated handle assembly, a lower elongated handle assembly, said upper and lower handle assemblies having pivotally mounted means therebetween and near one end thereof, pressure-sensitive tape supply means removably secured to said upper elongated handle assembly, tape advancing means within said upper elongated handle assembly and mechanically operated by means secured to said lower elongated handle assembly, hole punch means disposed between said upper and lower handle assemblies opposite said pivotal mounted means, tape guide means mounted adjacent said hole punch means, a tape cutting blade mounted rearwardly of said hole punch means, 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.

6. The pressure-sensitive tape applicator and hole punch of claim **1** having a tape supply canister for use in combination therewith which comprises, an enclosing housing, a pressure-sensitive tape roll within said housing, a tape exit port along one surface of said housing, and tape guide rails disposed near said tape exit.

7. The pressure-sensitive tape applicator and hole punch of claim **6** wherein the tape exit port is an extending lip from said housing, said extending lip containing said tape guide rails.

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WILLIAM S. LAWSON, Primary Examiner

U.S. Cl. X.R.

83—649; 156—513, 522, 530