United States Patent

McMahon

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[54] EMBOSSING TOOL WITH SELF LOADING TAPE FEED MECHANISM

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[51] Int. Cl. B41j 1/30

[58] Field of Search 197/6.7; 206/52

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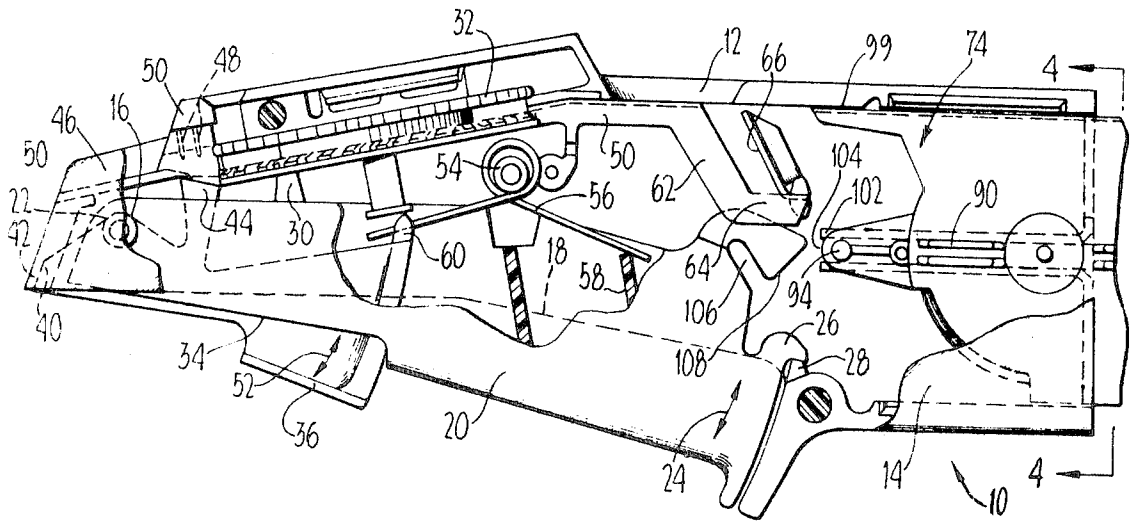
[57] ABSTRACT

A simplified hand-held, hand-operated, plastic tape embossing tool having a novel means for engaging the distal end of a coil of tape disposed in a cartridge or magazine and for feeding the same to and through a tape embossing station, without the necessity of manually feeding such tape end through the normal tape feed rolls.

13 Claims, 4 Drawing Figures



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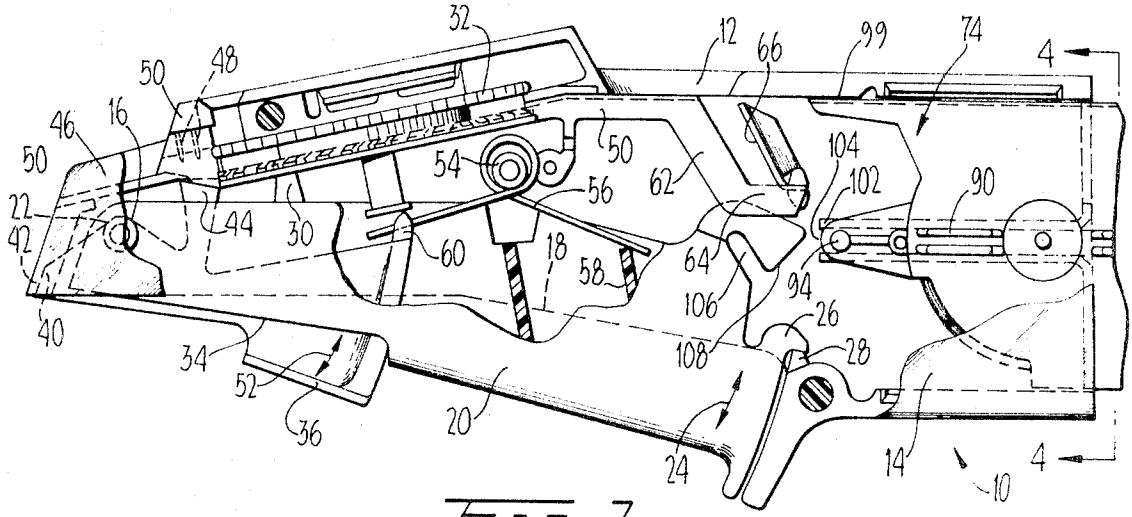

Fig_1

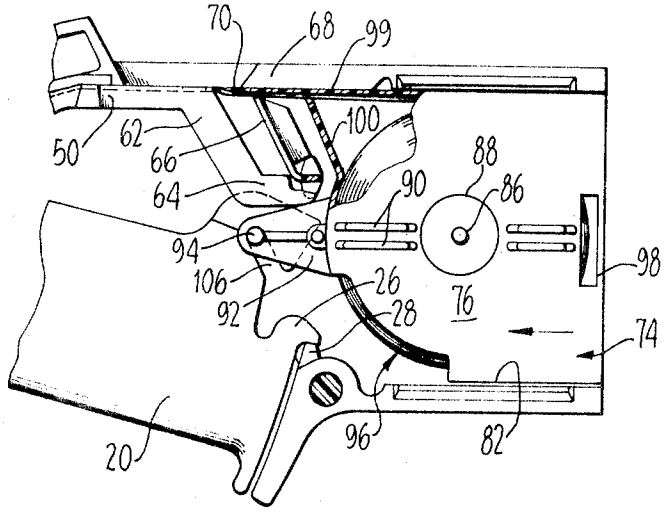

Fig_2

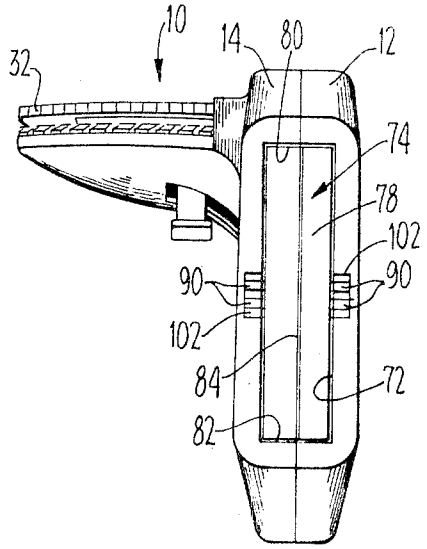

Fig_4

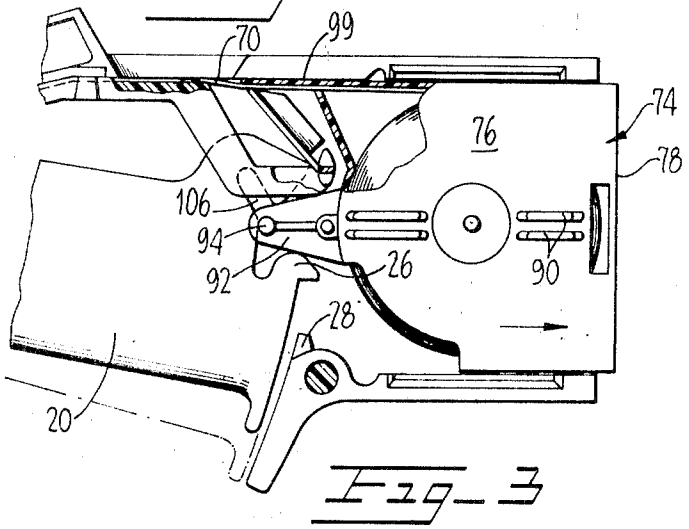

Fig_3

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EMBOSSING TOOL WITH SELF LOADING TAPE FEED MECHANISM

BACKGROUND

1. Field of Invention

This invention pertains to an embossing tool and more particularly concerns a self-loading means for feeding a tape or strip of plastic embossing material from a supply cartridge to and through such tool.

2. Prior Art

Hand-operated embossing tools of the type shown, for example, in U.S. Pat. Nos. 3,006,456 Souza; 3,083,807 Travaglio; 3,091,318 Carboni; 3,091,319 Sanders et al.; and 3,133,495 De Man, each include a manually operable knob connected to suitable tape feed rollers through which the distal end of a coil of tape must be fed when a new supply of such tape is placed in the tool. The knob is then rotated by the fingers of an operator to bring the forward portion of a strip of embossing material to the correct position at an embossing station in the tool. It has been deemed desirable to provide for this preliminary feeding of the strip material by some means or manner that would eliminate the manually tape feeding rotation. By so eliminating this step, speed and ease in starting the strip material in an embossing tool would be substantially increased.

SUMMARY

The present invention is achieved in a hand-held, hand-operated embossing tool by providing a mechanical linkage between a cartridge having strip material coiled therein and the trigger mechanism that effects the embossing operation so that the entire cartridge is retracted a precise distance away from the embossing unit station as the trigger is squeezed manually; and during such retraction of the cartridge the end portion of the strip material, which extends outwardly of the cartridge, is restrained by a one-way catch pawl from corresponding movement away from the embossing unit. In this manner a precise length of strip material is pulled or fed out of the cartridge. Release of the trigger will cause the cartridge to be pulled forward to its former position and in so doing the end portion of the strip material extending outwardly of the cartridge is moved forward on toward the embossing unit a precise amount.

Repeated operation of the trigger, which is also used to operate the embossing unit, causes continued incremental advancement of the strip material to and through the embossing unit in the embossing tool.

Additionally, the arrangement is such that when a new cartridge is placed in the tool, it is only necessary to have the free end of the tape coil extend outwardly from the cartridge. Then, by operation of the trigger, the tape end will automatically be engaged and advanced to the embossing station, without any manual feeding of such end into the tape drive means.

The features of novelty that are considered characteristic of this invention are set forth with particularity in the appended claims. The organization and method of operation of the invention may best be understood from the following description when read in connection with the accompanying drawing.

BrIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a side cutaway view of an embossing tool according to the present invention.

FIG. 2 is a partial view of the rear portion of the embossing tool of FIG. 1 showing details of the operation of the present invention in one position of the trigger mechanism.

FIG. 3 is a partial view of the rear portion of the embossing tool of FIG. 1 showing further details of the operation of the present invention in another position of the trigger mechanism.

FIG. 4 is an end view of the embossing tool of FIG. 1 looking in the direction of view lines 4—4 of FIG. 1.

DESCRIPTION OF A PREFERRED EMBODIMENT

The embossing tool **10** of the present invention includes a first or right-hand body portion **12**, and a second or left-hand body portion **14**. Each of the body portions may be formed from a single piece of material such as by casting or molding of metal or strong plastic material. The two body portions are then fitted together, as best shown in FIG. **4**, to enclose the other mechanisms of the tool as will now be described.

The forward end of each body portion is formed with a pin or stud receiving opening **16**; each opening **16** faces or opens toward the other opening on the other body position. In FIG. **1** only the opening **16** associated with the right-hand body portion is shown.

The lower portions of each body portion are provided with a trigger receiving cutout as best shown in FIG. **1** by the dotted line or edge **18** which shows the edge of the trigger receiving cutout for the right-hand body portion **12**.

A trigger member **20**, shown best in FIG. **1** as being hollow and open at its top portion, has a pair of pivot studs or pins **22** (only the right-hand stud is illustrated in FIG. **1**) extending outwardly from respective opposite sides of the trigger member near its forward end and fit into the corresponding openings **16**. The trigger member is thus pivotable about the openings **16** in the plane of the tool as shown by direction arrow **24**. Stop lugs **26** formed on the rearward end of each side of the trigger member **20** engage a corresponding stop member **28** provided in the inner portion of the body portions **12** and **14** near the rear of the trigger receiving cutouts for limiting the clockwise movement of the trigger member **20** (as viewed in FIG. **1**).

An embossing die engaging lug **30** is provided on the upper portion of the trigger member so as to engage with selective ones of the plurality of character dies on a rotatable die wheel **32** when the trigger member is squeezed or fully operated in the counterclockwise direction (as viewed in FIG. **1**).

The forward portion of the trigger member **20** is provided with a cutout at its lower or bottom portion as best shown in FIG. **1** by left-hand edge **34** of the trigger member's cutout. A tape or strip cutter lever **36** is disposed within the trigger member's forward end and pivoted on the same axis as the pivot axis of trigger member **20**. A stop lug **40** at the extreme forward edge of the cutter lever engages with the extreme forward walls **42** of the body portions **12** and **14** to limit the clockwise movement (as viewed in FIG. **1**) of the cutter lever. A cutter bed or anvil **44** is formed on the upper forward end of the cutter lever **36** for movement into engagement with embossed strip material that may be disposed in a strip path directly beneath a pair of cutter knives **48** disposed on a mounting bracket **50** when the cutter lever is squeezed or manually actuated in the counterclockwise direction, as shown by direction arrow **52**.

A spring mounting post **54** is formed on the inside of the right-hand body portion **12**. A trigger member and cutter lever biasing spring **56** is mounted on the post **54**. The rearward end of spring **56** bears against the top of a lug **58** on the trigger member **20** while the forward end of the spring **56** bears against the top of a lug **60** formed on the rearward end of the cutter lever **36**. The force or bias of the spring **56** is such as to releasably or yieldably bias both the trigger member **20** and cutter lever **36** in their clockwise direction (as viewed in FIG. **1**). It can also be observed that the trigger member **20**, and the cutter lever **36** are movable or pivotable independently of each other.

A mounting bracket **50** extending from the forward end of the body portions **12** and **14** to a position above the rearward end of the trigger member **20** is suitably fitted in appropriate receiving slots formed in the body portions.

A circular embossing disc **32** is mounted on the middle portion of the bracket **50**. Details of the embossing disc and its cooperation with the lug **30** are not necessary to understanding the present invention and no further discussion is made of

the disc here except to point out that embossing strip or tape material is fed in a path of travel between male and female dies of the disc as will be described below. Details of the structure and operation of the disc **32** may be found in any of the U.S. patents mentioned above.

The rearward end of the bracket **50** includes a downwardly projecting arm or section **62**, the lower end of which is provided with a rearwardly projecting arm or platform **64**.

A resilient pawl or embossing strip engaging member **66** is mounted on the upper surface of the arm **64** and slopes in the forward direction. The extreme upper end of the pawl **66** is spaced beneath a strip bearing platform **68**, formed by lateral protrusions provided on the body portions **12** and **14**, by a distance just slightly greater than the thickness of the strip material **70** to be fed through the tool **10** as described below.

The rearmost end of the body portions **12** and **14** defines a rearwardly directed opening **72** through which a strip material cartridge **74** may be inserted, the material being contained in the cartridge in coil form as best illustrated in FIG. **2** of the drawing. The design of the cartridge and its structural and functional cooperation with portions of the tool hereinafter described comprise an important portion of the present invention, so some description will first be made of the cartridge itself.

The cartridge **74** is preferably formed of plastic having opposed sidewalls **76**, rear wall **78**, a top wall **80** and a bottom wall **82**. The sidewalls are separable, such as by a hinge joint **84** permitting a coil of strip material to be placed therebetween about a central post **86** extending from one of the walls. An opening **88** is provided in the other wall circumscribing the post. A pair of horizontally spaced ribs **90** are provided on the exterior surface of each wall on both sides of the opening **88** for a purpose to be presently explained, and extending forwardly from the center of the cartridge is a bracket **92** whose forward distal end is provided with a pin **94**, extending laterally outward from the plane of each wall and lying along the longitudinal axis of the ribs. Subjacent the bracket **92** the cartridge has a curved opening **96** terminating at the bottom wall **82**. Slotlike openings **98** are also provided in sidewalls **76** adjacent the rear wall for viewing the amount of strip material in the cartridge. The top wall **80** of the cartridge is provided with a tangential extension **99** terminating a general vertical alignment with pin **94**. A tab element **100** extends forwardly and upwardly from bracket **92** and its upper end is positioned adjacent the lower surface of extension **98** in such a manner as to resiliently urge the emerging strip from the coil to be forced against the extension in a tangential disposition to the coil. The angular relationship of the tab permits the strip to be withdrawn from the cartridge, but effectively prevents contramovement into the cartridge.

Returning to the rear body portions adjacent the opening **72**, the opposed inner portions **12** and **14** are provided with horizontally extending rails **102** defining a channel **104** therebetween extending to the rear end of the tool. When the cartridge **74** is inserted through the opening **72**, the pin **94** and the ribs **90** will slide in the channel **104**, and the cartridge will be restrained against movement in the tool other than in a fore and aft horizontal direction.

In placing the cartridge into the tool, the supply end of the embossing material may extend past tab **100** in underlying relation to the exterior **98** and terminate at the forward end of the latter. The tab, as above explained, will permit pulling or withdrawal of the material so as to feed the same to the embossing station. Extending rearwardly and upwardly from the lower end of cam slot **106** is a cam surface **108** normally positioned in the path of the pin **94** of the cartridge.

Insertion of the cartridge **74** into the rear opening **72** of the tool **10**, as shown in FIG. **1**, causes the pin **94** to bear against the cam surface **108**, raising the trigger member and permitting further insertion of the cartridge into the tool. Manual squeezing or operation of the trigger member **20** in a counterclockwise direction, while still pushing inwardly on the cartridge **74**, brings the lower open end of cam slots **106** into alignment with the cartridge pin **94**, the pin entering the lower end of the cam slots as best shown in FIG. **3**.

Removal of squeezing force on the trigger member **20** permits the force of biasing spring **56** to return the trigger to its clockwise most position as shown in FIG. **2**. As the trigger member **20** thus returns to its normal clockwise most position, the sloped cam-slot **106** acts on the pin **94** to further pull the cartridge **74** fully into the tool **10**. Of course, as the cartridge is pulled fully into the tool, the exterior **98** and the strip material **70** lying subjacent the same will be positioned between the flexible pawl **66** and platform **68**.

Now, to advance the strip material from the cartridge, squeezing or manual operation of the trigger member **20** in the counterclockwise direction will cause the sloped cam slot **106** to push rearwardly against the cartridge pin **94** and move the cartridge rearwardly in the tool **10** by a precise incremental distance as illustrated in FIG. **3**. If, at this time, there is strip material **70** disposed in proper embossing position with respect to the disc **32**, further squeezing of the trigger member **20** will cause embossing of a character on the strip material in the conventional manner. However, such further squeezing of the trigger member does not cause further rearward movement of the cartridge since the pin is no longer being pushed by the cam slot.

As the cartridge is moved rearwardly in the manner above described, it is important to note that the upper edge of pawl **66** which already urges the strip material against the lower surface of extension **99** will prevent corresponding rearward movement of the material. In other words, the tape or strip material remains stationary while the extension **99** moves rearwardly, sliding over the tape. If desired, and as indicated, further pressure of the pawl against the tape may be effected by rocking the pawl in a clockwise direction by causing the upper portion of cam **108** to engage the forward surface of the pawl. This latter procedure is not essential, since in most circumstances it has been found that the forward slope of the pawl prevents the relative rearward withdrawal of the cartridge extension while holding the strip material stationary. When the trigger is released, forward movement of the cartridge, as above explained, causes the strip material to advance with the cartridge. In this latter connection, it is important to note that tab **100** assists in the forward movement of the strip material with the cartridge. Without such a device, the material could remain stationary relative to the tool and merely recoil itself in the cartridge.

Upon release of squeezing force on trigger member **20** the cartridge pin is once again engaged by the cam slot and the cartridge **74** is once again advanced by a precise distance into the tool, causing further advancement of the protruding end of strip material into and through the tool, in the same manner as described previously.

It can thus be appreciated that there has been shown and described an improved and novel embossing tool which includes a minimum number of moving parts, and such parts as are included provide for a unique strip feeding and advancing means in an embossing tool.

I claim:

1. In a tool for embossing characters on a strip material, said tool having body means and a manually operable trigger member, an improved means for advancing said strip material through said tool, said advancing means comprising:

supply means for holding said strip material in a coil with one end of the coil extending tangentially outwardly of said supply means;

means for slidably receiving said supply means in said body means;

means for moving said supply means a predetermined distance in one direction in said body means upon manual application of a force to said trigger member;

means for moving said supply means in the direction opposite to said one direction by a distance equal to said predetermined distance in response to release of said manually applied force;

means engageable with said one end of said strip material, said frictionally engageable means permitting advancement of said one end of said strip material in one direction as said supply means is moved in said one direction and inhibiting movement of said one end of said strip material with respect to said body means as said supply means is moved in said opposite direction.

2. In a tool according to claim 1 wherein said trigger member includes a cam surface, and wherein said supply means includes a member engageable with said cam surface, said cam surface effecting movement of said supply means as said trigger member is operated.

3. In a tool according to claim 1 wherein said frictionally engageable means comprises a resilient pawl mounted on said body means.

4. In a tool according to claim 1 wherein said body means includes rail members for guiding movement of said supply means within said body means.

5. In a tool according to claim 2 wherein said cam surfaces are formed on said trigger member and are sloped in the direction of movement of said one end of said strip material.

6. In a tool according to claim 5 wherein said frictionally engageable means includes a resilient pawl sloped in the direction of movement of said one end of said strip material, and wherein said body means includes a platform disposed adjacent said one end of said strip material, said pawl urging said one end of said strip material into sliding contact with said platform.

7. In a tool according to claim 1 wherein said tool includes an embossing unit, and said trigger member includes means for actuating said embossing unit as said trigger member is operated.

8. In a tool according to claim 7 wherein said means for moving said supply means is inactive when said trigger member is actuating said embossing unit.

9. In a tool according to claim 7 wherein said trigger member effects movement of said supply means during only a first position of the operation of said trigger member, and effects operation of said embossing unit during only a second position of the operation of said trigger member.

10. In a tool according to claim 9 wherein said trigger member is provided with a cam slot open at one end, and said supply means includes a pin engageable in said cam slot, said cam slot being arranged to push said pin out of said cam slot upon operation of said trigger member from its first position to its second position.

11. In a tool according to claim 1 in which said supply means is provided with a tab frictionally engaging said one end of said strip material, said tab permitting egress of said material from said supply means while restraining ingress thereof.

12. In a tool according to claim 11 in which said supply means is provided with a tangential extension overlying said tab and overlying said frictionally engageable means.

13. In an embossing tool of the character described having a body, embossing dies carried by said body, and a trigger member pivotally carried on said body and operatively connected to said dies for actuating the latter, the combination therewith of supply means for storing and dispensing strip material in coil form with one end of such coil extending outwardly from said supply means, means for moving said supply means away from said dies upon actuation of said trigger member, and means operatively connected to said trigger member and releasably engageable with said tape adjacent the coil thereof for grasping and moving said tape linearly away from said coil during movement of said trigger member in one direction and movement of said supply means away from said dies.

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