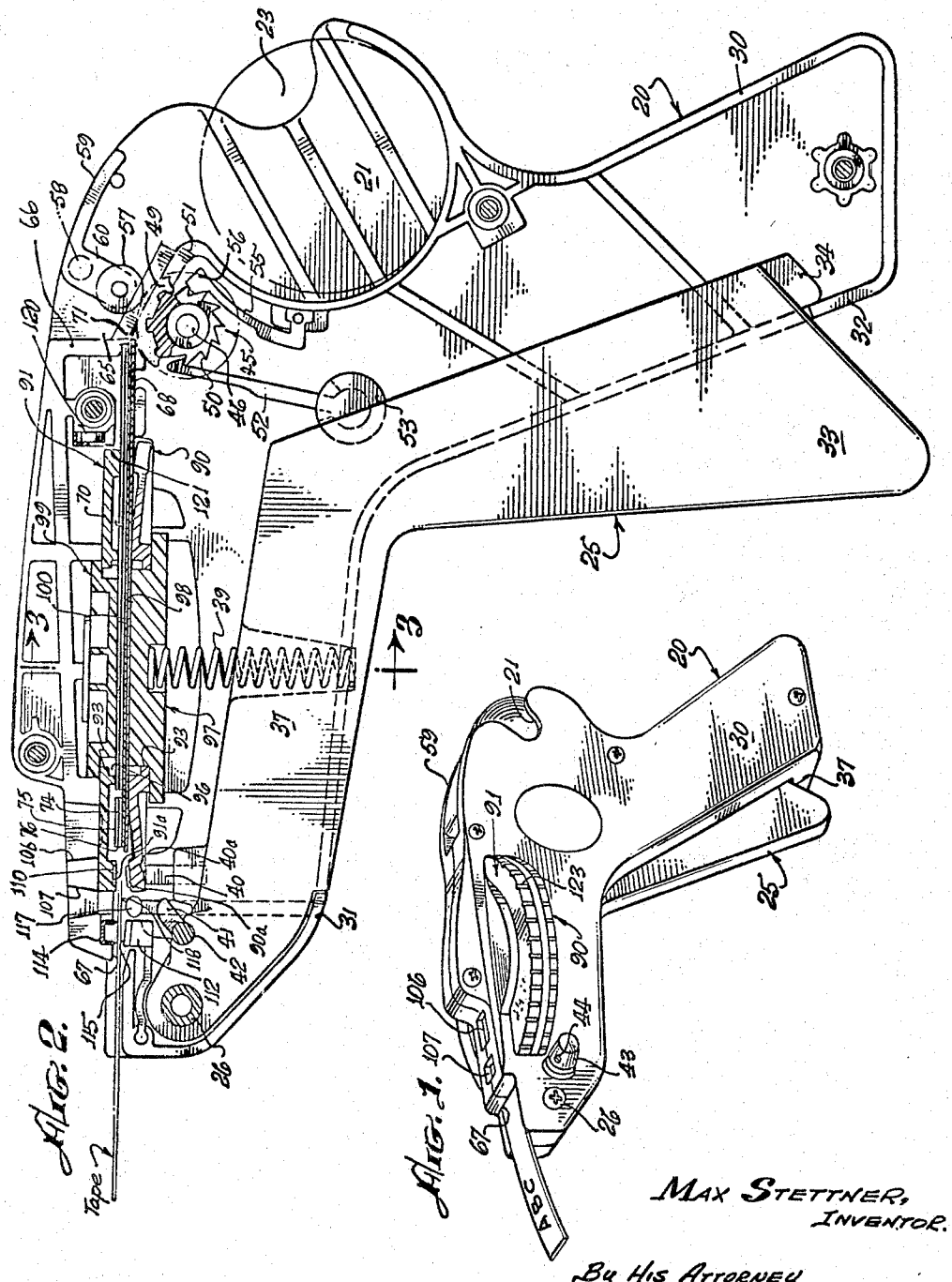
June 6, 1967 M. STETTNER 3,323,629

HAND EMBOSSING TOOL WITH REPLACEABLE TAPE TRACKS FOR DIFFERENT TAPE WIDTHS

Filed May 18, 1966 2 Sheets-Sheet 1



MAX STETTNER,
INVENTOR.

By His Attorney
Irvin A. Lavine

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FIG. 3.

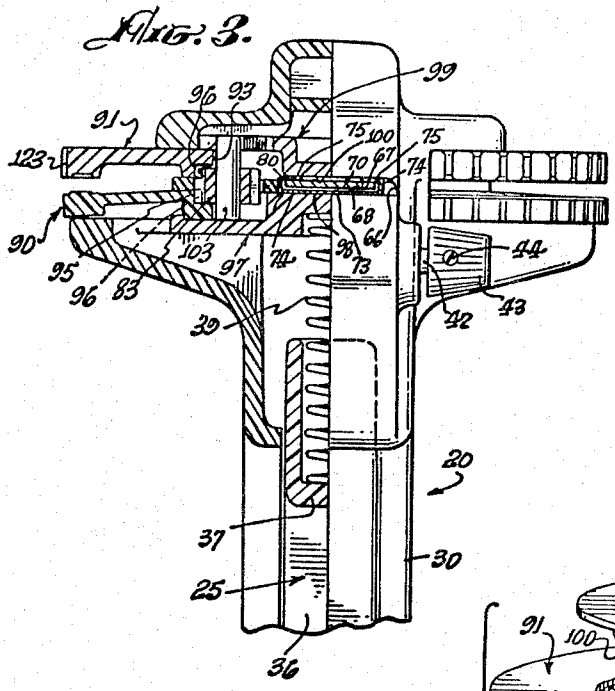


FIG. 4.

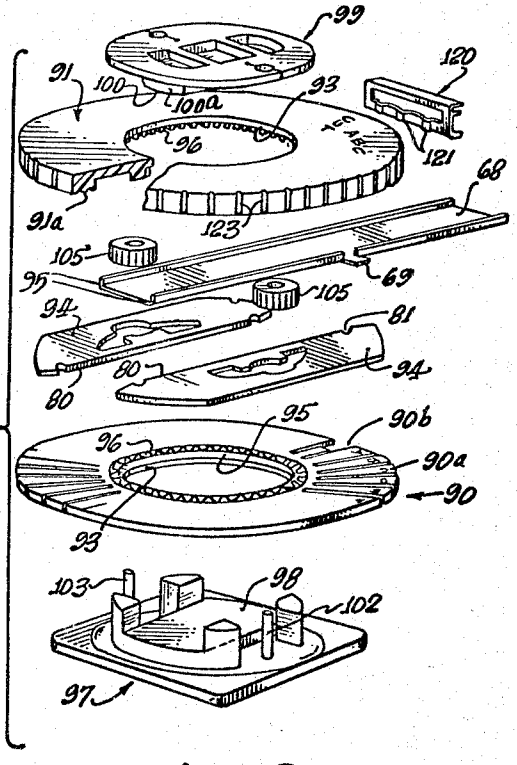


FIG. 5.

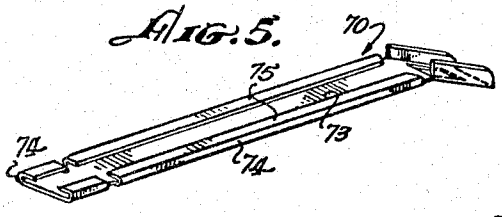
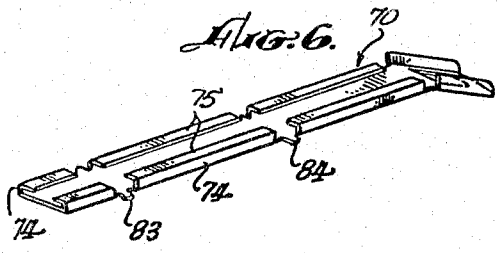


FIG. 6.



MAX STETTNER,
INVENTOR.

By His Attorney

Irvin C. Fairrie

United States Patent Office 3,323,629 Patented June 6, 1967

3,323,629

HAND EMBOSSING TOOL WITH REPLACEABLE TAPE TRACKS FOR DIFFERENT TAPE WIDTHS

Max Stettner, 3669 Sapphire Drive, Encino, Calif. 91316

Filed May 18, 1966, Ser. No. 551,123
4 Claims. (Cl. 197—6.7)

This invention relates to hand operated tools for embossing tape material and more particularly to an improved embossing tool adapted to utilize tape material of different widths. This application is a continuation-in-part of application Ser. No. 393,629 filed Sept. 1, 1964.

Hand operated embossing tools of the type wherein a tape of material is fed between a pair of dies which are actuated to emboss a letter or character into the tape material by cold flow stresses are well known to the art. Such tools are characterized by those shown and described in U.S. Patents Nos. 2,275,670 and 2,415,526. In such tools actuation of a handle or trigger moves the dies into embossing engagement with the tape and release of the handle or trigger causes the tape to be advanced one space for reception of the next letter or character. The letter or character being embossed is typically selected by the user by rotating a dial or wheel containing the various letters or characters prior to each actuation of the handle or trigger. While utilized for embossing many tape materials, such tools have had greater usage in the embossment of adhesive thermoplastic tapes. Hand operated tools of the prior art, although satisfactory for most operations, have disadvantages, particularly in being adaptable only for one material or width of material to be embossed and in the difficulties encountered in determining the last character, or last few characters, which have been embossed on the tape.

It is an object of the present invention to provide an improved tape material embossing tool in which the last letter or character embossed on the tape material is visible.

It is another object of the present invention to provide an improved embossing tool economical to manufacture and simple and efficient in operation.

It is a primary object of the present invention to provide an improved hand operated embossing tool for tape material in which tape material of various widths can be utilized.

Yet another object of the present invention is to provide an embossing tool which can be quickly and easily adapted to various widths of tape material.

It is a further object of the present invention to provide an embossing tool of the above type in which the tape material is embossed, advanced, and cut by operation of the same actuating lever.

A further object of the present invention is to provide an embossing tool of the character described in which less pressure is required by the operator to emboss or cut than is necessary in such tools known to the prior art.

The present invention is a hand operated embossing tool having a selectively removable tape track adapted to receive tape material of first predetermined width. The tape track can be removed and replaced by a track adapted to receive tape material of a second width to thus adapt the tool for embossment of tape material of the second width. The tool of the present invention is so constructed and arrangement that the rotatable male and female die

are oriented such that the center of rotation for selection of the embossment character is coincident with the centerline of the tape i.e., the tape is coincident with a diameter of the die wheel. The character is then impressed by the selected die at the point along the diameter of the die wheel and a viewing opening is adjacent thereto such that upon release of the actuating lever the last embossed character is visible.

The novel features which are believed to be characteristic of the invention, both as to its organization and method of operation, together with further objects and advantages thereof will be better understood from the following description considered in connection with the accompanying drawing in which a presently preferred embodiment of the invention is illustrated by way of example. It is to be expressly understood, however, that the drawing is for the purpose of illustration and description only, and is not intended as a definition of the limits of the invention.

In the drawing:

FIGURE 1 is a perspective view of the presently preferred embodiment of the present invention;

FIGURE 2 is a sectional view taken along line 2—2 of FIGURE 1 and parts in elevation;

FIGURE 3 is a view taken along line 3—3 of FIGURE 2 showing half of the tool in elevation;

FIGURE 4 is an exploded view in perspective of the rotatable dies in accordance with the present invention;

FIGURE 5 is a view in perspective of a tape track to adapt the embossing device to material of one width; and

FIGURE 6 is a view similar to FIGURE 5 showing a tape track to adapt the device to a tape of lesser width.

Although the present invention is suitable for use with various tape materials it is especially useful for the embossment of thermoplastic adhesive tape material of the type well known to the art and will accordingly be described in connection with such use. These materials are typically formed of color pigmented vinyl plastic rigid sheet material of uniform color which when embossed to deform the material beyond the cold yield point produces an embossment having a color which contrasts with that of the uniform color of the sheet. Such plastic tape materials and tools for embossing the same have been widely used for efficiently and easily forming adhesive tapes upon which names, identifying characters, numbers, and the like are embossed by the user and then adhered to the article. The plastic tape is typically formed in rolls with an adhesive material on one surface thereof covered by a backing tape which is removed when the embossment has been finished and the embossed tape is to be adhered to a surface. Rolls of such plastic tape material are commercially available in various standard widths such as ¼", ⅜" and ½" and a user may require various widths for various applications. In the prior state of the art it has been necessary to employ a different embossing tool for each width of tape. As stated above the present invention is applicable to various types of tape materials but for clarity and illustration the invention will be described in connection with the use of such deformable plastic tape material and such material will be referred to hereinafter as plastic embossing tape.

As set out hereinbefore the present invention constitutes an improvement in the well known hand embossing tools of the type where the plastic tape is positioned between male and female dies which are actuated to form the embossment by cold flow of the plastic tape. The

.nale and female dies are of the type well known to the art formed at the periphery of a die wheel or turntable. The die turntable includes a top plate with a series of intaglio dies arranged circularly at its under surface and a flexible disc having radial slots whereby flexible teeth are provided which can be bent independently of each other. These teeth have raised die portions at their free ends which selectively cooperate with the intaglio dies during an embossment operation as more fully described hereinafter.

Referring now to the drawings, the improved tool in accordance with the present invention includes a main body **20** which forms one arm or handle of the device and also defines a magazine **21** into which a roll of plastic tape is inserted. The body **20** is formed of molded plastic or other suitable structural material. In the presently preferred embodiment Cycolac high impact styrene plastic is utilized. The body is formed in left and right sections in the conventional manner which are joined upon assembly of the tool to enclose the working internal components.

An operating handle **25** is pivotally connected to the longitudinally extending body **20** proximate the forward end thereof, i.e., to the left in the orientation of the figures. The handle, or trigger, is mounted by means of a pivot pin **26** which extends through the left and right portions of the body and forms a trigger bearing. The handle portion **30** of the body **20** facing the trigger **25** is hollow and open between flanges **31** and **32** to allow movement of the trigger **25** into and away from the body. As shown particularly in FIGURE 2 the trigger is generally inverted L-shaped and the downwardly extending leg **33** is the actuated portion, i.e., the portion which is squeezed into the body by the user. A protruding lip **34** at the lower end of the trigger engages the flange **32** to limit the outward movement of the trigger. The upper portion **37** of the trigger is substantially contained within the body as shown in FIGURE 1. A compression spring **39** is positioned between the trigger and a fixed point in the body to urge the trigger outwardly into the deactuated position. Thus, the trigger is movable by the user from the outward position shown in FIGURE 1 to the inward position against the force of spring **39**. A die punch **40** is formed integrally with the trigger **25** near the forward end thereof in a position which causes it to be raised vertically when the trigger is pressed inward. Thus, at the upper surface and extending upwardly from the trigger the cutting punch is positioned just rearwardly of the trigger bearing **26**. A cutting punch **41** is pivotally mounted upon the trigger forwardly of the die punch by means of a rotatable shaft **42**. The shaft **42** is mounted in a suitable bearing in the trigger and protrudes from the body as shown in FIGURE 1. A knob **44** is locked upon the shaft by a set screw **43** and the cutting punch is thus pivotable from a non-operable position as shown in FIGURE 2 to the operable position shown in dotted lines for cutting the embossed tape as described hereinafter.

The tape is fed forwardly from the magazine **21** by a friction roller which is rotated sufficiently to advance the tape one printing space each time the trigger is actuated. This is accomplished by a ratchet wheel arrangement in cooperative combination with the trigger **25**. Thus, a ratchet drive wheel **45** is pivotally mounted upon a bearing pin **46** which extends transversely through the body below the tape path. As shown in FIGURE 2 the ratchet drive wheel is formed with twelve equally spaced ratchet teeth around the circumference of the wheel at one end thereof. A rubber drive wheel **49** is affixed to the ratchet drive wheel at the center thereof and extends to a greater radius than the ratchet teeth **50**. The radius of the rubber drive wheel **49** is such that it extends upward through an opening defined in an interior body wall **51** which extends from the magazine and supports the tape track as described hereinafter. The ratchet wheel is normally engaged by a pawl **52** which is resiliently maintained in contact with the ratchet teeth by means of a guide groove defined by the body **20**. The pawl **52** is pivotally mounted upon the trigger by bearing **53**. The construction and arrangement of the pawl is such that when the trigger **25** is pressed inward into the body as the trigger pivots about bearing **26** the pawl slips over a ratchet tooth **50**. Upon release of the trigger, pawl **52** actuates the ratchet wheel and as the trigger is moved outward by the spring **29** the ratchet wheel is rotated through sufficient arc to advance the tape through one printing space. A ratchet spring arm **55** is affixed to the body with a retention tooth **56** urged into engagement with the ratchet teeth **50** such that the ratchet wheel can be rotated in only one direction.

Positioned above the rubber drive wheel **49** is a tape roller wheel **57** formed of aluminum or like material which is pivotally mounted within the body upon a pivot bearing **58**. The tape roller wheel has a rearwardly extending arm **59** and a downwardly extending portion **60** of sufficient length to place the surface of the tape roller wheel **57** which is pivotally mounted upon the portion **60** in contact with the circumference of the rubber drive wheel **49**. The tape roller wheel is maintained in contact with the rubber surface by a relative movement of the drive wheel **49**. By means of the rearwardly extending arm **59** the tape roller wheel **57** can be pivoted away from the rubber drive wheel **49** by an upward and forward motion of the extending arm **59**.

Pivotal movement of the tape roller wheel away from the rubber drive wheel allows removal and replacement of the tape track. Thus, referring now particularly to FIGURES 2, 3 and 5 the body **20** is so formed that a longitudinally extending channel opening extends from a position just forward of the rubber drive wheel to the forward end of the body. Thus, there is a longitudinal opening provided from the point **65** through body wall **66** forward to the outlet opening **67** for the tape. Within the opening a channel member **68** is positioned and is fixedly retained in the housing to define the base and sides of the opening.

In the preferred embodiment of the invention the channel member comprises a base and parallel upstanding side flanges **95** which extend along the entire length of the channel member. The channel member is made of metal sufficiently thin to be resilient; thus a tape track referred to hereafter can be inserted into the channel member and can frictionally engage the upstanding side flanges of the channel member. An ear **69** retains the channel member in the body. Into this longitudinal opening defined by the channel member a tape track **70** of predetermined width is inserted by raising the tape roller wheel out of contact with the rubber drive wheel and inserting the tape track **70** as shown particularly in FIGURE 5 through the opening **71** in the wall **66**. The tape track is a generally channel shaped member with a base **73** and upwardly extending side walls **74** with inwardly return flanges **75** a slight distance above the base to retain the tape between the side walls and between the base and the return portion of the side walls of the tape track. The tape track extends to a forward point **76** which is just rearward of the die impressing station of the tool. At the rearward end of the tape track the track is bent downwardly at a slight angle such that it rests upon and is supported by the tape support wall **51** extending from the magazine **21**. The distance between the side walls **74** of the tape track is determined by the width of tape which is to be used. That is, if ¼" tape is to be used in the tool the distance between the vertical portions of the side walls is approximately ¼", while if a ⅜" tape is to be used the distance is ⅜", and the distance is ½" when ½" tape is to be employed. The width of the channel member through the body is defined by the upstanding side flanges **95** of the channel member and is at least ½" or of sufficient width as to accommodate the maximum tape track which is to be inserted into the tool. The tape tracks for tape which is less than the maximum width includes a pair of bearing tabs **83** and **84** pro-

vided at each side of the tape track which are spaced apart along the tape track. The retaining tabs are shown as **83** and **84** in FIGURE 6 which shows a tape track for tape of less than maximum width. When a tape track of the maximum width is inserted into the channel member **68** side walls **74** of the tape track frictionally engage the resilient upstanding side flanges **95** of the channel member. If, alternatively, a tape track of less than the maximum width is inserted into the channel member, bearing tabs **83** and **84** at each side of the tape track frictionally engage the resilient upstanding side flanges **95** thus serving to frictionally retain the tape track within the channel member.

Referring now particularly to FIGURES 1 through 4 the die turntable construction in accordance with the present invention is shown. As discussed hereinbefore the present invention provides means for advancing the tape along a diameter of the turntable which allows the embossing to be done at the furthermost point of the die turntable relative to the direction of movement of the tape. Thus, no center pivot or connection between the male and female portions of the turntable is allowable. In the presently preferred embodiment the male section **90** and female section **91** are annular in shape with an inside opening of lesser diameter. The male and female sections are spaced apart by a pair of spacers **94** at opposite sides of the channel member. The male and female sections have inside diameter walls **93**. In the inside walls **93** peripheral gear teeth **96** are formed in alignment between the two sections. The teeth extend upwardly from the lower surface of female section **91** and downwardly from the upper surface of male section **90**. A lower axle member **97** is positioned beneath the male section **90** with a support flange **97***a* upon which the male section rests. A raised surface **98** of the lower axle member extends to and supports the channel member **68**. Spaced above the lower axle member is an upper axle member **99** with a lower surface **100** positioned at the upper edge of the channel member to define the upper surface of the channel member. The upper axle member has an upper radial flange **101** in bearing contact with the inner portion of the upper surface of the female die section **91**. The portion of the upper axle member which depends from the flange **101** is longitudinally extending and mateable with the opening through the female section **91** such that the lower surface **100** is adjacent the upper edge of side flanges **95** of the channel member and in the assembled position. The upper **99** and lower **97** axle members and spacers **94** are stationary with respect to the body of the tool. As shown particularly in FIGURE 3 the upper and lower axle members are connected at opposite sides of the body exteriorly of the channel member by gear posts **102** and **103** which are at a radial distance from the centerpoint of the die assembly which is slightly less than the diameter of the inside wall **93** of the die members. A spur gear **105** is rotatably mounted upon each of the gear posts **102** and **103** in engagement with the peripheral gear teeth **96** in the wall **93** of the male and female die sections. The gears **105** in mesh with the gear teeth **96** allow the male and female die sections to be rotated about the axle members **97** and **99** in locked engagement and rotation of either the male or female die section will cause the other to move correspondingly. A retaining detent member **120** is positioned adjacent the circumference of the die with protrusions **121** in detent engagement with indentations in the circumferential surface of the die wheel.

Referring now particularly to FIGURES 1 and 2 an indicia opening **106** and a viewing opening **107** can be seen. In opening **106** the letter to be embossed is seen and the die is accordingly rotated until the desired letter or character is in view through the opening **106**. Thus, in operation with the proper tape track inserted into the tool the end of the tape is fed from the roll **23** in the magazine between the drive wheel **49** and tape roller **57**. By operation of the trigger the tape is advanced until the portion to be embossed passes from the forward end **76** of the tape track

to the position between the dies at embossing station **110**. Actuation of the trigger then causes the letter on view in the opening **106** to be embossed by raising the plunger **40** which is turn causes the male die **90***a* to be pressed into the female die **91***a* with the tape therebetween. This occurs upon inward actuation of the trigger **25**. As the trigger is released spring **39** forces it outward and the pawl advances the tape one letter space. Movement of the tape by one space causes the character just embossed to appear in the viewing opening **107**. Thus, the last letter or character embossed is immediately visible so that the user can see the preceding letter prior to embossing the next letter with no space between and with no need to advance and retract the tape. When it is desired to remove the embossed tape the die turntable is rotated to the "cut" designation **90***b* which corresponds to a missing die in the die wheel **90** as at **111** in FIGURE 4. The cut knob **44** is rotated to bring the cutting punch with a cam surface into engagement with a pivoted anvil **112** and forces the anvil against a cutting and scoring knife **114**. The anvil **112** is pivotally mounted and normally urged away from the tape. A rounded cam surface on the cutting punch moves the anvil into engagement with the tape. Movement of the trigger with the die wheel in the cut position then moves the anvil against the tape. The upper surface **115** of the anvil **112** is inclined such that the forward blade of the knife **114** cuts through the tape while the rearward knife cuts only partially therethrough to score the tape and allow ready removal of the adhesive backing therefrom. Positioned between the die and anvil is a pedestal **117** affixed to the body with a support surface **118** in the path of the tape to prevent the tape from moving downward between the embossing station **110** and the anvil.

To adapt the tool for embossing tape of a different width it is necessary only to pivot the tape roller wheel away from the drive wheel to allow removal of the tape and tape track from the tool after which a roll of tape of different width and a corresponding tape track is inserted into the tool.

Thus, the present invention is an improvement over embossing tool heretofore known to the art in that it provides means for adapting the tool to tapes of various widths and allows the last embossed character to be immediately viewed.

What is claimed is:

1. A tool for embossing a continuous tape of material comprising a body, a handle pivotally connected to said body, complementary die members positioned in said body between which said tape is adapted to pass, said dies being actuated by movement of said handle toward said body, a ratchet wheel and a rotatable drive wheel transversely mounted on said body rearwardly of said die members for simultaneous rotation, spring pawl means engageable with said ratchet wheel and operable by said handle to rotate said ratchet wheel and said drive wheel in a single direction;

a channel defined by and longitudinally extending through said body, said channel being open at both ends thereof and providing an access opening through said body;

a channel member longitudinally extending within said channel, said channel member being fixedly attached within said channel; and

a tape track, said tape track being adapted to slideably engage said channel member, and said tape track being of a predetermined width smaller than said access opening, and being adapted to receive tape material of a predetermined width.

2. The apparatus of claim **1** wherein said longitudinally extending channel member comprises a base and two parallel upstanding side flanges running the length of said channel member, said upstanding side flanges having a parallel spaced relationship defined by said base, said upstanding side flanges having sufficient resiliency to frictionally engage said tape track.

3. The apparatus of claim 2 wherein said channel guide member is metallic.

4. The apparatus of claim 2 wherein said tape track is adapted to frictionally engage said upstanding side flanges of said channel member, said tape track being slideably removable from said channel member through said access opening, and said tape track being adapted to receive and guide tape material of predetermined width, said tape track extending to a position proximate to and rearwardly from said die members.

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ROBERT E. PULFREY, *Primary Examiner.*

E. S. BURR, *Assistant Examiner.*