

April 21, 1964

B. E. BOGEAUS

3,129,800

STRIP EMBOSsing IMPLEMENT

Filed March 18, 1963

5 Sheets-Sheet 1

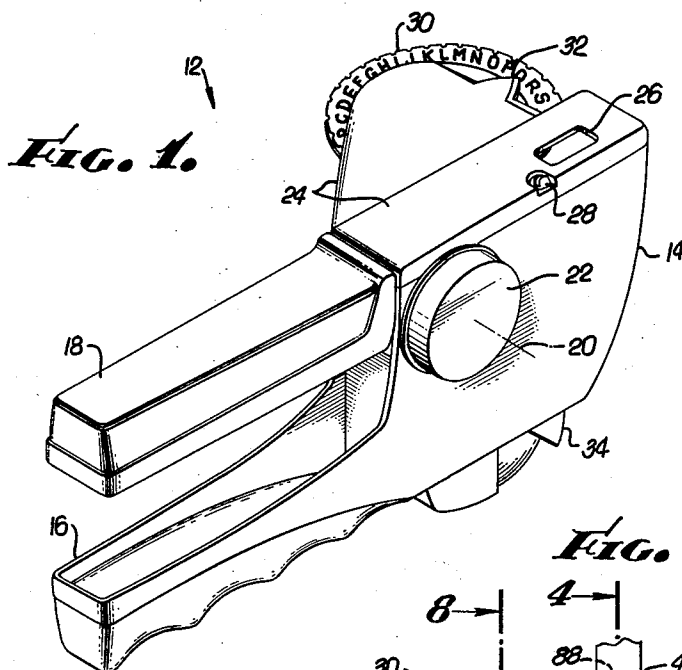


FIG. 1.

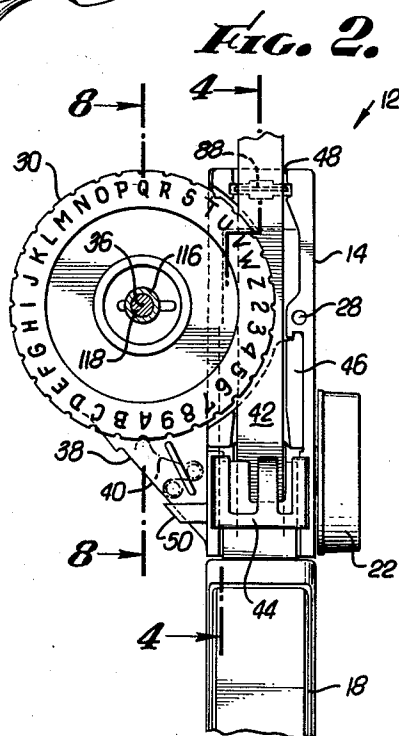


FIG. 2.

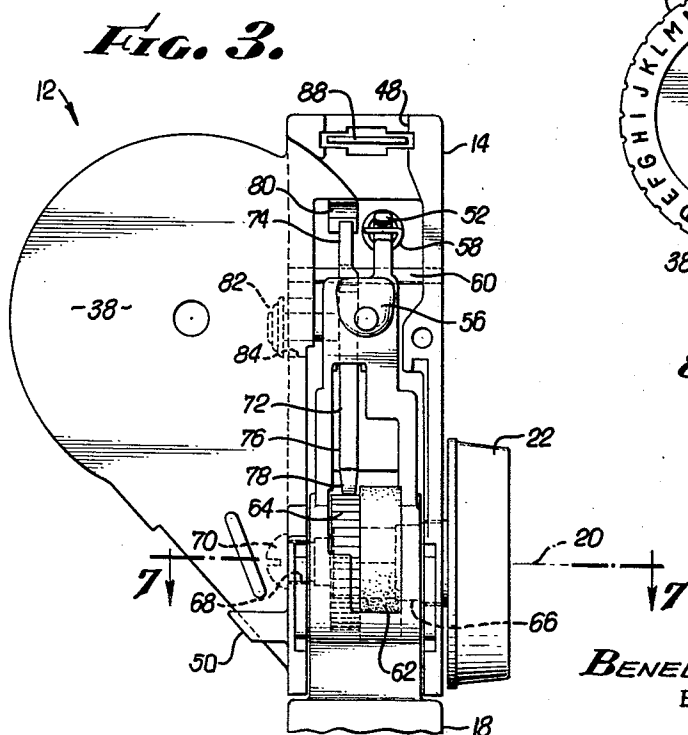


FIG. 3.

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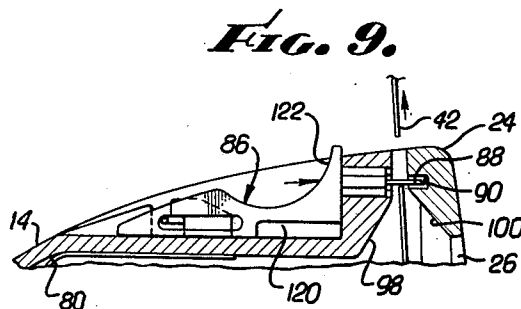
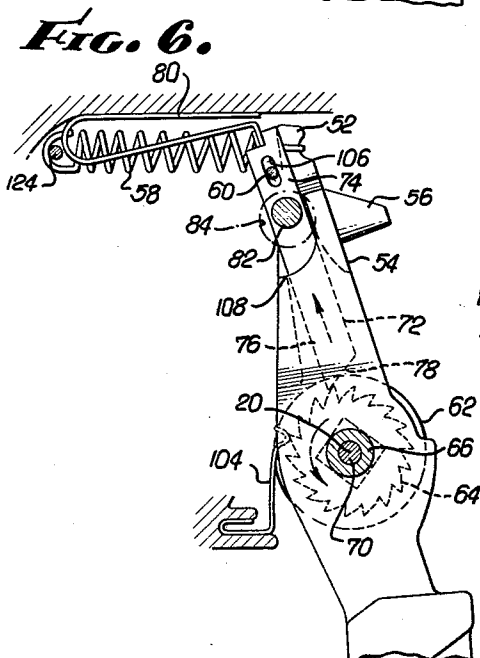
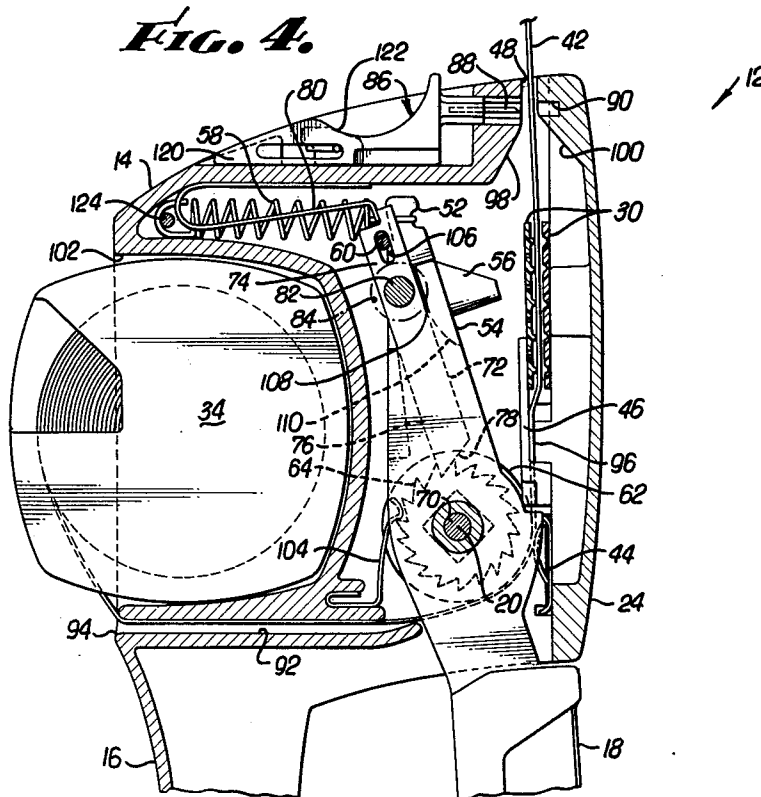
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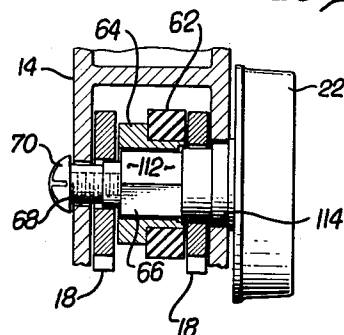
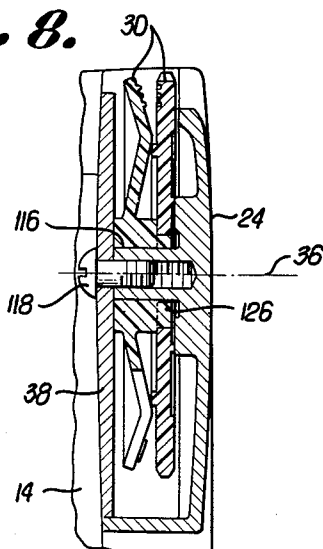
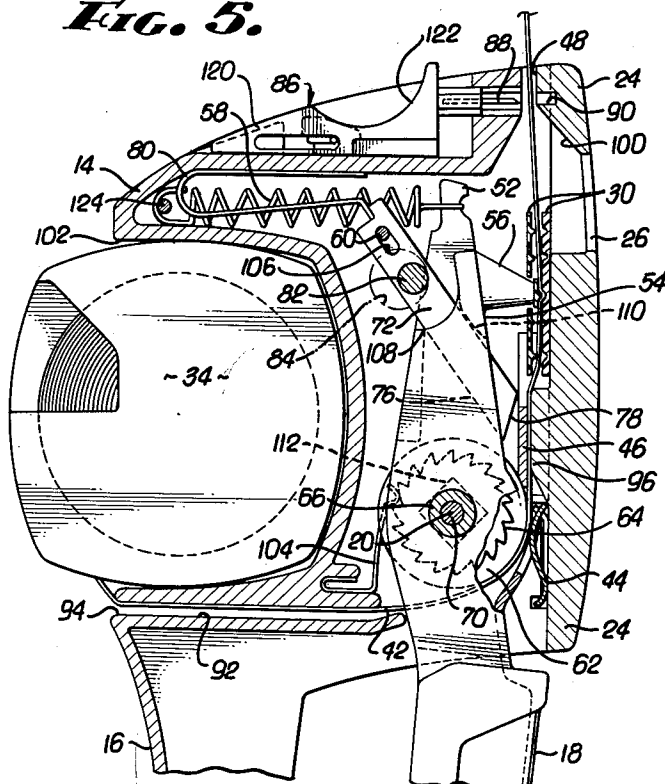
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STRIP EMBOSSING IMPLEMENT

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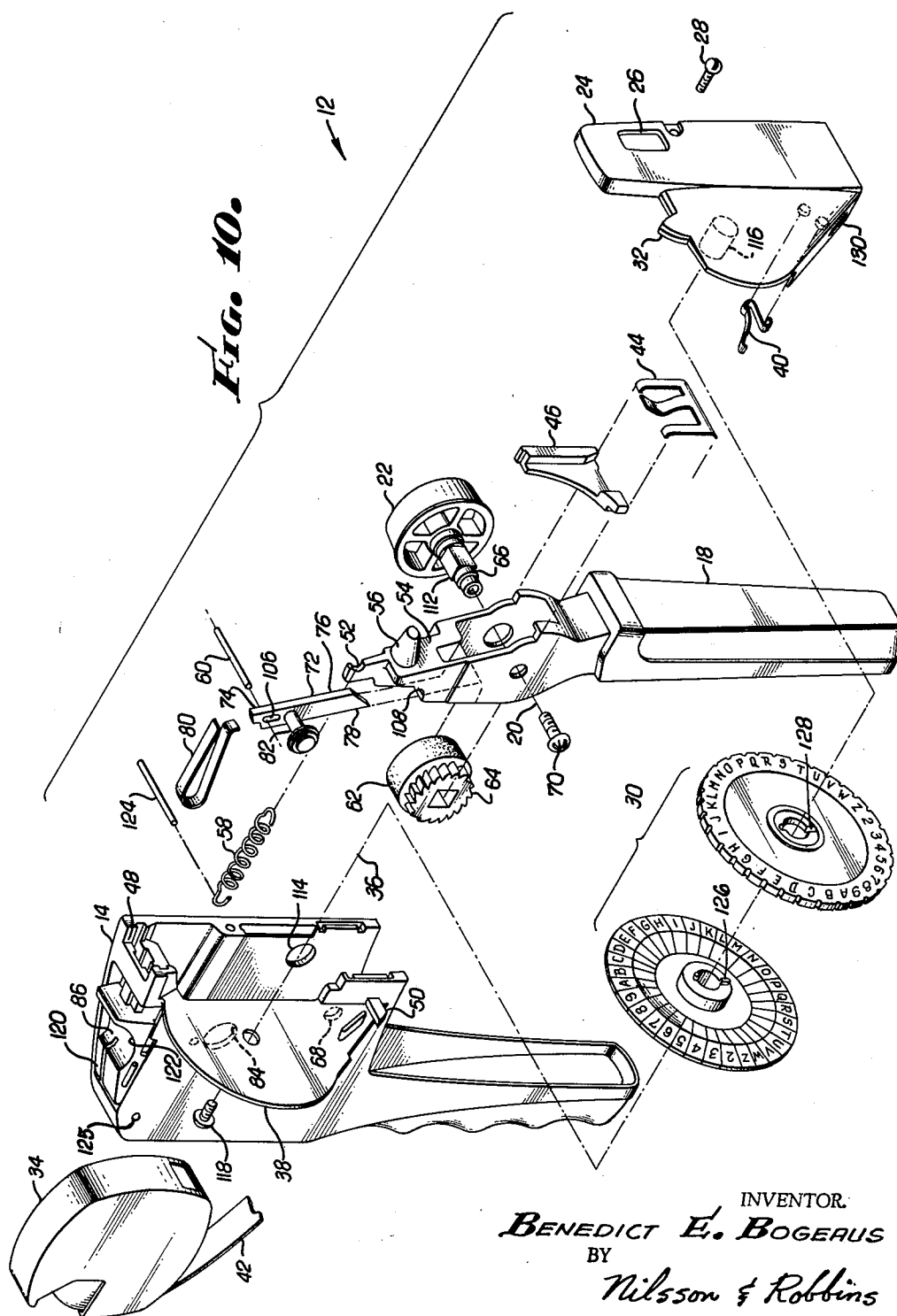
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FIG. 11

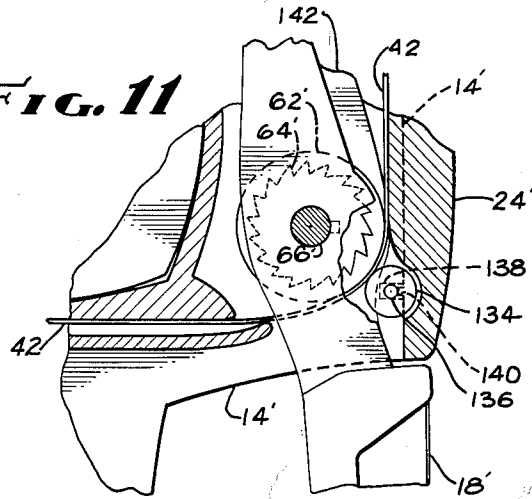


FIG. 12

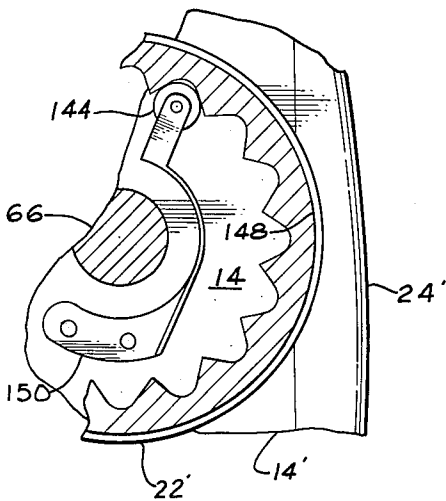
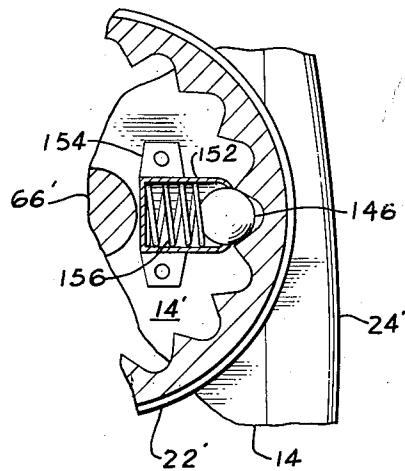


FIG. 13



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STRIP EMBOSsing IMPLEMENT
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Filed Mar. 18, 1963, Ser. No. 265,725
14 Claims. (Cl. 197—6.7)

This invention relates generally to the impressing of characters or other indicia onto strips of embossable material, and more particularly to an improved hand held and hand operated printer for making strip labels or tags such as from a length of contrast color embossable plastic dispensed from a magazine carried by the device.

With the development in recent years of thin sheet plastics which, when crazed by an embossing process, assume a sharply contrasting color or reflectivity in the crazed area compared to the sheet background color, a number of hand held hand operated tools for embossing and dispensing strip labels have been developed. In general, the better of these tools utilizes two hinge-pivoted handle members, one of which supports a dispensing magazine, a ratchet feed mechanism, and a rotatable, indexed embossing die means. The handle members are hinge-pivoted at their front ends, and an anvil extension spaced rearwardly therefrom on one handle member engages the embossing die means, supported on the other, when the operator urges the two handle members toward each other. The action is that of a lever of the second class and requires a relatively great magnitude of tangential displacement at the handles' rear ends in order to move the anvil extension a given distance toward the die means.

The hinge action is also used to operate the ratchet feed mechanism which is disposed rearwardly of the anvil extension. The tape magazine is carried at the extreme rear end of one of the handle members; and its output of tape is fed over the distance of a handle length, through the feed mechanism, past the die means, past a viewing window, and out of the front end of the tool.

Typically such prior art tape embossing tools suffer the disadvantages of being relatively large and heavy and not optimally convenient to handle and operate. In addition they are mechanically complicated with many interrelated moving parts causing them to be relatively expensive to manufacture, and, because of wear and fragility of the moving parts, relatively difficult and costly to maintain. Further, due to the placement of the tape magazine in the extreme rear end portion of one of the handles, an extended threading process is required to bring the tape end from the magazine to the feed mechanism; and when the feed is reversed, buckling of the tape in the extended region results. Furthermore, in this connection, it is, as a practical matter, useful but not possible or practical in tape embossers heretofore available to be able to advance the tape from between the die members for observation of the last embossed character or characters and then to reverse the tape and continue printing without irregular or faulty spacing of the characters.

A final disadvantage to be noted in connection with such prior art devices is that because of the large magnitude of relative motion between the handle members required for actuation of the feed ratchet and die anvil, and in order to minimize the overall dimensions of the tool, the handle members approach each other very closely during the embossing step. The close approach thusly required causes annoyance and danger to the operator because of pinching of the tissue of the operator's hand.

It is therefore an object of the present invention to provide a hand operated, portable, strip embossing device which does not suffer these and other disadvantages of the prior art.

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It is another object to provide such an implement which is relatively simple in its construction and mechanically reliable.

It is another object to provide such an implement which is highly compact and light in weight.

It is another object to provide such an implement which holds tape dispensing magazines integrally in its body portion.

It is another object to provide such an implement which does not require manual threading of the embossing tape over an extended distance through or along a handle member.

It is another object to provide such an implement with which the operator may arbitrarily advance and reverse the tape and restart without irregular or faulty spacing of the imprinted characters and which rewinds the tape into the magazine during the reversing step.

It is another object to provide such an implement which achieves tape advance and embossing with relatively slight motion of a single handle member.

It is another object to provide such an implement which cannot pinch the hand of the operator.

It is another object to provide such an implement in which the embossing force applied by the die actuating anvil is relatively independent of the force applied to the movable handle so that uniform embossing is accomplished whether the operator is a small child or a large man.

Briefly, in accordance with the structural features of an example of the present invention, these and other objects are achieved in an embossing implement having a body portion which contains a tape magazine and a ratchet feed mechanism and which has a rigid handle extension. A movable handle is carried by the body and is pivoted about the axis of the feed ratchet and is disposed in a manner to form, with the rigid handle extension, a cooperating pair of handles to be gripped by an operator's hand. The handle extends forwardly of its pivot axis in the manner of a lever of the first class and its forward extension carries an upwardly projecting, small punch and anvil member adapted to move upwardly to engage and actuate an embossing die when the handle is squeezed downwardly toward the right handle extension.

An action multiplier-bar is provided which is pivotally carried at one end by the body at a point forwardly of the handle pivot axis. The other end of the multiplier-bar extends rearwardly and forms a ratchet pawl which engages the ratchet drive of the feed mechanism.

The multiplier-bar is engaged by the forward extension of the handle at a point near the latter's front end which bears upwardly against a mid portion of the multiplier-bar in a manner such that the latter acts as a lever of the third class with respect to pivotal movement of its pawl end with respect to its forward end. In this manner a downward displacement of the handle causes an upward motion of its forward extension. This upward motion is amplified by the multiplier bar so that its pawl end suffers a considerably greater upward motion than that of the forward end of the handle. This motion of the pawl is utilized as its back stroke so that with very small handle displacement the ratchet is fully enabled for a drive stroke.

The handle is firmly spring-biased toward an upward position, so that when released, by the grip of the operator's hand, the handle returns upwardly and its forward extension returns downwardly. A pawl return member affixed to the forward extension of the handle and disposed in engagement with the multiplier-bar, forcefully pulls the latter downwardly providing, at its pawl end, a drive stroke against the drive ratchet.

The disposition and upward extension of the die actuat-

ing anvil member is such as to actuate the embossing die responsive to upward displacement of the handle forward extension of a magnitude slightly greater than that required to back stroke the ratchet drive.

In this example of the invention, the feed mechanism comprises a tape magazine housing formed integrally with the body portion and disposed adjacent to and below the multiplier bar and forward extension of the handle. The tape output of the magazine is fed substantially directly to a cylindrical, rubber covered portion of the driving ratchet. The tape is held in firm frictional engagement with the upper part of the rubber portion of the ratchet by a smooth surfaced spring which bears radially inwardly thereagainst. An automatic spacing centering detent spring is also provided between the body portion and the ratchets of the ratchet drive to provide a positive placement and an audible tape advance-reverse index.

Further details of these and other novel features and their operation as well as additional objects and advantages of the invention will become apparent and be best understood from a consideration of the following description taken in connection with the accompanying drawings which are all presented by way of an illustrative example only and in which:

FIGURE 1 is a rear-quarter perspective view of an example of a strip embossing implement constructed in accordance with the principles of the present invention;

FIGURE 2 is a plan view of a portion of the device of FIG. 1 with a cover plate removed for illustration;

FIGURE 3 is a view similar to that of FIG. 2 with additional exposure provided by the removal of parts normally held captive by the cover plate;

FIGURE 4 is a partially longitudinally sectioned view of the major portion of the device of FIG. 1 in its normal state, taken along the lines 4—4 of FIG. 2;

FIGURE 5 is a view similar to that of FIG. 4 with the embossing die shown actuated;

FIGURE 6 is an isolated view of the actuating handle extension, action multiliter-bar, and tape feeding ratchet;

FIGURE 7 is a cross sectional view of the structure shown in FIG. 3 taken along the lines 7—7 thereof;

FIGURE 8 is a cross sectional view of the structure shown in FIG. 2 taken along the lines 8—8 thereof;

FIGURE 9 is a sectional view illustrating the operation of the tape cutter feature of the invention;

FIGURE 10 is an exploded perspective view of the assembly of FIG. 1;

FIGURE 11 is a sectional view like a portion of FIG. 5 illustrating an alternative example of the invention; and

FIGURE 12 and FIGURE 13 are sectional views of alternative examples of the tape advance knob (22) and associated components.

Referring to the figures in more detail it is stressed that the particulars shown are by way of example only and are presented in the cause of providing what is believed to be the most useful and readily understood description of the structural concepts and principles of the invention. The detailed showing is not to be taken as a limitation upon the scope of the invention which is defined by the appended claims forming, along with the drawings, a part of this specification.

In FIG. 1 a tape embossing implement 12 is shown including a housing body 14 having a handle extension 16 formed integrally therewith. A movable handle 18 is pivotally affixed to the housing body 14 and is journaled about a pivot axis 20 which is concentric with a manual tape advance knob 22. A cover plate 24 is secured to the top of the housing body 14 by means including a machine screw 28 and has a viewing window 26 formed therein for viewing the embossing tape after it has passed between the mated portions of a rotatable embossing die 30. The cover plate 24 is also adapted to form a pointer 32 which indicates to the operator which particular character impressing means is disposed in an actuating position with respect to the tape to be embossed. An embossing tape dispensing magazine 34 is frictionally re-

tained within the housing body 14 as will be shown more in detail in connection with the subsequent figures.

Note that the movable handle 18 in cooperation with the rigid handle extension 16 form a cooperating pair of hand grips adapted to be gripped by the operator's hand and displaced pivotally toward each other to provide action for achieving the mechanical functions of the invention. It is further to be noted that the length of the handle members 16, 18 are just long enough to be conveniently grasped by one hand; in practice this length may be approximately $3\frac{1}{4}$ ".

In FIG. 2 the tape embossing implement 12 is viewed from above with the cover plate 24 removed. The rotary die 30 is seen to be journaled about an axis 36 which is carried by a shelf 38 formed integrally with the housing body 14. For purposes of properly positioning the rotary displacement of the die 30 its periphery is scalloped as shown and a detent spring 40 affixed to the cover plate 24 is provided. In this view the route to the embossing tape 22 is shown to emerge from within the housing body 14, travel between a leaf compression spring 44 and a rubber like tape drive cylinder (see subsequent figures), over a removable tape guiding plate 46, between the mated halves of the die 30, to the tape outlet 48 of the embossing implement.

A tongue member 50 affixed rigidly to the housing body 14 functions in a manner to be more fully described below, in firmly securing the cover plate 24 to the housing body 14. The machine screw 28 and a machine screw along the axis 36 in cooperation with the tongue member 50 cooperatively provide a three point anchoring for the cover plate. The movable handle 18 and the manual tape advance knob 22 are illustrated in their respective positions as carried by the housing body 14.

In FIG. 3 the assembly is shown with the spring 44 removed, the tape 42 withdrawn, the tape guide plate 46 removed, and the die 30 removed from its supporting shelf 48. In this view the movable handle 18 is seen to extend beyond its pivot axis 20 into the interior of the housing body 14 and to terminate in a tension spring engaging hook 52. Also affixed to this forward portion 54 of the movable handle 18 is a punch anvil 56 which as will be seen more clearly below is adapted to actuate the embossing die when the forward portion 54 of the handle is pivoted upwardly by pivotally displacing the handle 18 downwardly toward the handle extension 16 of the housing body. A firm tension spring 58 is interconnected between the engaging hook 52 and a lower portion of the housing body 14 to provide a biasing force for holding the handle 18 in its extreme upward location with respect to the housing body 14, as illustrated in FIG. 1. A pin member 60 forms a stop for the outward or upward disposition of the handle 18 by directly limiting the downward displacement of the forward portion 54 of the handle.

As indicated previously the manual tape advance knob 22 is pivoted about the axis 20. Also arranged about this major pivot axis and rotationally coupled to the knob 22 is a rubber like tape drive cylinder 62, and a driving ratchet wheel 64. The cylinder 62 and the ratchet wheel 64 are in this example a unitary assembly which is rotationally keyed to an axial extension 66 of the knob 22. The end of the axial extension 66 projects through an opening 68 in the wall of the housing body 14 opposite from the knob 22 and a machine screw 70 is threaded therein for retaining the assembly pivotally within the housing body 14.

It may be noted that although it requires a very small amount of tangential displacement of the forward portion 54 of the handle to actuate the rotary die 30 with the punch anvil 56, a significantly greater magnitude of action is required to drive positively the rotation of the tape drive cylinder 62. To this end, instead of requiring a sufficiently large motion of the handle 18 or its forward portion 54, thereby causing the implement to be awkward and inconvenient, and subject to the disadvan-

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tages of the prior art, a handle action-multiplying-bar 72 is provided. The multiplier-bar is in this example pivoted near its forward end 74 about the pin member 60. Its rear end 76 forms a pawl 78 for actuating rotary motion of the driving ratchet wheel 64. As will be shown in more detail below, the opening in the multiplier-bar 72 for the pin member 60 is longitudinally elongated to provide a longitudinal freedom of movement for the multiplier-bar so that it may be pushed forwardly out of locking engagement with the ratchet wheel 64, when the knob 22 is advanced in the forward direction. The multiplier and its pawl 78 are urged toward and normally into engagement with the ratchet wheel 64 by a leaf spring 80 which will be shown in more detail below. A knob extension 82 affixed to the multiplier-bar 72 and projecting through the side wall of the housing body 14 is provided for purposes of urging the multiplier-bar 72 forwardly against the spring 80, out of engagement with the ratchet wheel 64, to permit reverse rotation of the knob 22 when desired. To permit this longitudinal motion of the knob extension 82 and to permit its initial installation into the housing body an enlarged opening 84 is provided in the wall of the housing body 14.

Multipplier-bar engaging means affixed to the forward portion 54 of the handle 18 for pivoting the multiplier bar about its pivot axis, pin member 60, are shown more clearly in the subsequent figures, to which reference will now be had.

In FIG. 4 which is a sectional view taken as indicated in FIG. 2, longitudinally through the major portion of the implement 12 and more particularly through the housing body 14, the assembly is shown with the cover plate 24 affixed and the tape 42 threaded through the implement from the tape magazine 34 to the tape outlet 48. Also illustrated in this view is a thumb-operated tape cutter 86 which may be urged against a spring (not shown) to pass a cutting blade 88 through the tape 42 near the implement outlet 48. A blade receiving recess 90 is provided in the cover 24 to provide full clearance for the shearing blade 88 in passing through the tape.

Additional details of the tape handling structure associated with the housing body 14 are illustrated in FIG. 4. For example, a tape threading tunnel 92 is provided which communicates from the output of the tape magazine 34 to the region of the tape drive cylinder 62. With this configuration it is seen that threading of the implement is provided by inserting the end of the tape 42 into the inlet 94 of the threading tunnel 92 and urging it there-through until due to its curvature from having been wound into the magazine 34 the end of the tape 42 places itself between the tape drive cylinder 62 and its cooperating leaf compression spring 44. Once in this position, rotation of the drive cylinder 62 either by manual rotation of the knob 22 or by actuation of the ratchet wheel 64, the tape is automatically guided by the tape guide plate 46, and cooperating extensions 96 of the cover plate 24, to the region as shown between the halves of the rotary die 30 and thence by the funneling surfaces 98, 100 past the cutter blade 88 to the outlet 48 of the implement. Once the tape 42 has been inserted and placed in contact with the driving cylinder 62, the magazine 34 may be slidably inserted into the magazine housing 102 which is formed integrally with the housing body 14; and further feeding of the tape in either the advance or reverse direction, out of or into, the magazine is automatic.

For purposes of accurate spacing of the embossed characters along the length of the tape 42 as well as for indicating the number of spaces of advance or reverse accomplished by the rotation of the manual knob 22 a detent spring 104 is supported by the housing body 14 in resilient engagement with the teeth of the ratchet wheel 64 in a manner to permit its rotation in either sense of rotation.

Referring in more detail to the handle actuated driving mechanism it may be seen that the handle 18 is pivoted

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about the axis 20 and has its forward portion 54 extending into the forward regions of the housing body 14 where it is ultimately terminated by the spring engaging hook 52 which is engaged by the tension spring 58. The punch anvil 56 is shown in profile and the entire forward portion 54 is shown urged against its stop formed by the pin member 60.

The multiplier-bar 72 is shown pivoted about the pin member 60; and an elongated opening 106 is provided through the multiplier-bar 72 to permit the abovementioned longitudinal freedom of motion of the multiplier-bar. The leaf spring 80 is shown urging the multiplier-bar into engagement with the teeth of the ratchet wheel 64. The knob extension 82 and its associated opening 84 in the housing body, which provide means for manually moving the multiplier-bar against the spring 80 and out of engagement with the teeth on the ratchet wheel, are also shown; and their action will be illustrated in detail in FIG. 6 below.

The forward portion 54 of the handle 18 is formed in a manner to be longitudinally relieved to permit the disposition of the multiplier-bar 72 therewithin. The opening thus formed through the forward portion 54 is transversely defined by an engaging ledge 108 and a return shelf 110.

In operation, when the handle 18 is pivotally displaced toward the handle extension 16, the forward portion 54 of the handle is moved against the force of the spring 58 toward the die 30. The engaging ledge 108 of the forward portion 54 of the handle engages the multiplier-bar 72 and in the manner of a third class lever pivotally rotates it about the pin member 60 which causes its pawl end 78 to be moved also in the direction toward the die as well as forwardly against the force of the leaf spring 80 until it is disengaged from the tooth of the ratchet wheel 64, this action constitutes the backstroke for the pawl 78 with respect to the ratchet wheel. During this action the ratchet wheel and tape drive cylinder 62 remain stationary.

Referring to FIG. 5 the action just described is shown with the handle 18 pivotally displaced toward the handle extension 16 to the extent that the punch anvil 56 has engaged the rotary die 30 and has actuated a selected character impression portion thereof. The multiplier-bar 72 may be seen to have been pivoted about the pin member 60 by virtue of the engagement between the multiplier-bar and the engaging ledge 108 of the forward portion 54 of the handle. The ratchet wheel 64 and the tape drive cylinder 62 still remain stationary. The multiplying action of the multiplier-bar 72 is impressively illustrated in this figure: although the handle has moved less than 10 degrees, the multiplier-bar has been pivoted approximately 45 degrees. This action in this example of the invention may be considered to be a combination of first and third class levers and requires approximately $\frac{3}{8}$ of an inch of total tangential displacement at the rear end of the handle 18 toward the handle extension 16. The corresponding tangential displacement required merely to disengage the pawl 78 from one ratchet tooth and place it in engagement with the succeeding tooth is approximately $\frac{3}{16}$ of an inch. It may be noted that prior art tools require approximately three times this magnitude of displacement to perform the corresponding functions.

The backstroke, or pawl releasing stroke, has been described above as occurring when the handle 18 is depressed toward the handle extension 16. The ratchet driving stroke occurs when the handle 18 is released by the operator's grip, and the tension spring 58 returns the forward portion 54 of the handle to its downward position away from the die 30. As the forward portion 54 is so returned, the return shelf 110 engages the multiplier-bar 72 and forcefully pulls it back into its position as shown in FIGURE 4. During the last few degrees of the pivot return motion of the handle 18, the pawl end 78 of the multiplier-bar 72 engages the succeeding tooth on the ratchet wheel 64 and advances the tape drive cylin-

der 62 with the force of the tension spring 58 exerted by the return shelf 110 on the multiplier bar 72.

Referring to FIG. 6 the action of the knob extension 82 on the multiplier-bar 72 is illustrated. The knob is pressed forward to move the multiplier-bar against the leaf spring 80 thereby sliding the multiplier-bar 72 longitudinally with respect to its pivoting pin member 60, in the opening 106 therethrough. With the knob extension 82 displaced all the way forwardly against either the rear edge of the elongated opening 106 or the opening 84 in the housing body 14, the pawl end 78 is totally removed from engagement with the teeth of the ratchet wheel 64 so that the tape drive cylinder 62 and the ratchet wheel 64 may be rotated by the manual tape advance knob 22 in either direction of rotation. The detent spring 104 provides a number of functions as described above, one of which is to provide an indication means to the operator of the number of spaces that the embossing tape has been advanced or retracted.

Referring to FIG. 7 a view showing the manual tape advance knob 22 and its axle extension 66 in elevation is presented. The axle extension 66 is shown journaled within the housing body 14 and the handle 18. The ratchet wheel 64 and rubberlike tape drive cylinder 62 are shown rotationally keyed to the squared mid-portion 112 of the axle extension 66 wherewith the knob 22 and the drive cylinder and ratchet wheel assembly are all rotated synchronously. The extreme end of the axle extension 66 projects through and slightly beyond the side wall of the housing body 14, and a machine screw 70 is threaded therein to secure the rotatable assembly. For removal of the assembly, the screw 70 is removed and the axle extension is withdrawn through an enlarged opening 114 in the opposite side wall of the body 14.

In FIG. 8 the mating halves of the rotary die 50 are illustrated as journaled about a bushing 116 projecting downwardly from the cover plate 24. A machine screw 118 passes through an opening in the die supporting shelf 38 and aids in firmly securing the cover plate 24 to the housing body 14.

Referring to FIG. 9 a detailed view of the tape cutter 86 is shown in the state of parting the tape 42. The body 120 of the tape cutter includes a thumb detent 122 formed therein for urging the cutter blade 88 through the tape and into the blade receiving recess 90. A spring and a grooved track housed within the cutter body 120, not shown, serve to return the tape cutter 86 to the left as viewed in the drawing, thereby to withdraw the cutter blade 88 from the path of the tape 42.

Referring to FIG. 10 an exploded view of the assembly of the tape embossing implement 12 is shown for purposes of providing a clear illustration of the structural and functional relationships embodied in this particular example of the present invention. FIG. 10 is intended to provide the reader with a helpful reference to the form and disposition of many of the structural elements shown in more detail in the previous figures. To that end, here, as throughout the specification, like reference numerals have been applied to like elements for clarity of presentation.

The housing body 14 is illustrated with its handle extension 16, die supporting shelf 38, cover plates retaining tongue member 50 affixed thereto. The other securing means for the cover plate 24 are also shown, namely, the machine screws 118, 28. The pair of holes 68, 114 for journaling the manual tape advance knob 22 and its axle extension 66 are seen to pass through the sidewalls of the body portion 14. Note the squared mid portion 112 of the axle extension 66 which rotationally keys the axle extension 66 within the ratchet wheel 64, drive cylinder 62 assembly.

The inwardly relieved nature of the handle 18 in the region of the pivoting center about the axle extension 66 and forwardly thereof, to permit the passage of the multiplier-bar 72, is shown. Particular note should be made

of the engaging ledge 108 and the return shelf 110. The details of the multiplier-bar 72 may be seen with considerable clarity including its pawl end 78, its knob extension 82, its elongated opening 106 for the pin member 60, and its rearwardly biasing leaf spring 80. The handle returning tension spring 58 is shown adapted to be stretched between the spring engaging hook 52 of the forward portion 54 of the handle and a spring retaining pin member 124 which may be pressed through a pair of openings 125 near the bottom of the housing body 14.

The two halves of the rotary die 30 are shown with their key 126 and slot 128 for rotationally connecting the two halves properly together. Note that the printed indicia on the righthand half, as shown in the drawing, are displaced 90 degrees from the embossing font shown on the lefthand half, to provide a proper correlation between the position of the pointer 32 and the particular portion of the die in actuating position with respect to the punch anvil 56. The detent spring 40 for the rotary die 30 and a retaining opening 130 for the tongue member 50 and the bushing 116 are shown in connection with the cover plate 24. The leaf spring 44, the central finger of which bears compressively against the rubberlike tape drive cylinder 62 as well as the removable tape guide plate 46 are illustrated in perspective in the figure.

Particular note may be made in connection with the tape dispensing magazine 34 that its broad sides are domed outwardly slightly. This feature provides retaining friction for holding the magazine within the magazine housing, not shown, in the housing body 14 and at the same time minimizes the friction between the sides of the magazine and the coiled tape 42 therewithin. By virtue of this means, the tape may be automatically retracted into the magazine merely by reverse rotation of the tape drive cylinder 62 with the manual tape advance knob 22.

In FIG. 11, a system, alternative to the E shaped leaf spring 44, is illustrated for compressively holding the strip tape in non-slipping, rolling contact with the tape drive cylinder 62'. The sectional view of this figure is taken in a manner similar to that of FIG. 5. In this example, however, the leaf spring 44 and the tape guide plate 46 have been omitted and their function is accomplished by a pressure roller 134 mounted on a roller shaft 136. The roller and shaft are supported against lateral movement by a pair of symmetrically disposed slots 138, one only of which is shown, formed in the top portion of the housing body 14'. The downward displacement of the roller 134 and shaft 136 is limited by its pressure contact with the tape 42 or the tape drive cylinder 62 directly, when the tape is not in place the ends of the shaft 136 are depressed downwardly within the slots 138 by a respectively associated pair of tab extensions 140 which are formed, in this example, integrally with the cover plate 24'. If desired, the material of the roller 134 may be rubber or rubber-like to improve its tape driving cooperative relation with the tape drive cylinder 62' and to minimize abrasion or other deleterious effects on the tape 42.

The tape 42 is guided, in this example, after it leaves its region of compression between the two rollers (cylinder 62' and roller 134) by a side vane 142 which may be formed integrally with the handle 18'.

The ratchet wheel 64' functions as in the previous examples except that here no detent spring 104 is employed for engagement with the ratchet teeth and valleys along the periphery of the wheel 64'.

A detent mechanism may be utilized externally of the tape drive cylinder 62' and ratchet wheel 64' in the manner illustrated in the examples of FIG. 12 and FIG. 13. Each of these figures is a sectional view taken through the external manual tape advance knob 22' in a section plane perpendicular to the keyed axle 66' of FIG. 11 and viewed in the direction toward the housing body 14'.

The inner periphery of outer portion of the knob 22' may be escalated, as shown, to form a repetitive evenly spaced detent system. A floating detent "ball" resiliently urged radially outwardly is then provided in the form of a spring mounted roller 144 (FIG. 12) or ball 146 (FIG. 13). In the former case, the roller 144 is supported on the body 14' by a circularly formed flat mounting spring 148, which is affixed rigidly to the body 14' at the spring end 150. In the case of the ball 146 of FIG. 13, it is supported within a small housing cylinder 152 which is in turn affixed rigidly to the body 14' by a pair of securing tabs 154. A coil spring 156 is disposed within the cylinder 152 and urges the ball 146 radially outwardly into a ball and detent engagement with the scalloped periphery of the knob 22'.

There have thus been disclosed and described the structural and operational features of an example of a tape embossing implement which achieves the objects and exhibits the advantages pointed out hereinabove. It is again stressed, however, that the scope of the invention is not to be limited by this detailed showing; but is to be measured by the terms of the following claims.

What is claimed is:

1. A tape embossing implement of the character adapted to include a rotary embossing die and comprising: a body having a handle member extension affixed rigidly thereto; a movable handle disposed in a single hand grip relationship with said handle extension and being pivoted about a first fulcrum formed by a pivot axis carried by said body, said handle including a forward portion extending beyond said fulcrum and within said body; punch anvil means carried by said forward portion of said handle and adapted to move in a first direction to actuate a predetermined character impressing portion of said die when said handle is pivotally displaced toward said handle extension; spring biasing means for urging said forward portion oppositely from said first direction; an action multiplier-bar pivoted about a second pivot axis carried by said body forwardly of said first pivot axis, said multiplier-bar having a fulcrum forward end engaged by said second pivot axis and a rear pawl end, said multiplier-bar having a mid portion disposed and adapted to be engaged by said forward portion of said handle and moved thereby in said first direction when said handle is pivotally displaced toward said handle extension and in said opposite direction when said handle is released.

2. A tape embossing implement of the character adapted to include a rotary embossing die and comprising: a body having a handle member extension affixed rigidly thereto and including a housing means formed integrally with said body for removably retaining a tape dispensing magazine; a movable handle disposed in a single hand grip relationship with said handle extension and being pivoted about a pivot axis carried by said body, said handle including a forward portion extending beyond said axis and within said body, said forward portion of said handle being adapted to move in a first direction when said handle is pivotally displaced toward said handle extension; spring biasing means for urging said forward portion oppositely from said first direction; a tape drive wheel including a tape gripping cylindrical surface and ratchet assembly rotatably supported concentrically about said first pivot axis; an action multiplier-bar pivoted about a second pivot axis carried by said body forwardly of said first pivot axis, said multiplier-bar having a fulcrum forward end engaged by said second pivot axis and a rear pawl end for engaging said ratchet, said multiplier-bar having a mid portion disposed and adapted to be engaged by said forward portion of said handle and moved thereby in said first direction when said handle is pivotally displaced toward said handle extension and in said opposite direction when said handle is released.

3. A tape embossing implement of the character

adapted to include a rotary embossing die and comprising: a body having a handle member extension affixed rigidly thereto and including a housing means formed integrally therewith for removably retaining a tape dispensing magazine; a movable handle disposed in a single hand grip relationship with said handle extension and being pivoted in a first class lever fashion about a first fulcrum formed by a pivot axis carried by said body, said handle including a forward portion extending beyond said fulcrum and within said body; punch anvil means carried by said forward portion of said handle and adapted to move in a first direction to actuate a predetermined character impressing portion of said die when said handle is pivotally displaced toward said handle extension; spring biasing means for urging said forward portion oppositely from said first direction; a tape drive wheel including a tape gripping cylindrical surface and ratchet assembly rotatably supported concentrically about said first pivot axis; an action multiplier-bar forming a lever of the third class pivoted about a second pivot axis carried by said body forwardly of said first pivot axis, said multiplier-bar having a fulcrum forward end engaged by said second pivot axis and a rear pawl end for engaging said ratchet and a mid portion disposed and adapted to be engaged by said forward portion of said handle and moved thereby in said first direction when said handle is pivotally displaced toward said handle extension and in said opposite direction when said handle is released, said rear, pawl end of said multiplier-bar being structurally adapted to perform a backstroke with respect to said ratchet when moved in said first direction and a ratchet drive stroke when moved in said opposite direction by the force of said spring biasing means.

4. In a tape embossing implement of the character having a body with a handle member extension affixed rigidly thereto and a movable handle disposed in a single hand grip relationship with the handle extension and being pivoted in a first class lever fashion about a first pivot axis carried by the body, the handle having a forward portion extending beyond the first pivot axis and within the body, spring biasing means for urging the handle and handle extension apart, and a tape gripping cylindrical surface and ratchet assembly rotatably supported concentrically about the first pivot axis, the combination therewith of: an action multiplier-bar forming a lever of the third class pivoted about a second pivot axis carried by the body forwardly of the first pivot axis, said multiplier-bar having a fulcrum forward end engaged by said second pivot axis and a rear pawl end for engaging the ratchet and a mid portion disposed and adapted to be engaged by the forward portion of the handle and moved thereby in a first direction when said handle is pivotally displaced toward the handle extension and in the opposite direction when said handle is released, said rear, pawl end of said multiplier-bar being structurally adapted to perform a backstroke with respect to said ratchet when moved in said first direction and a ratchet drive stroke when moved in said opposite direction by the force of said spring biasing means.

5. In a plastic tape embossing implement of the character including a rotary embossing die, a body having a handle member extension affixed rigidly thereto and including a housing means formed integrally therewith for removably retaining a tape dispensing magazine, a movable handle disposed in a single hand grip relationship with the handle extension and being pivoted about a first pivot axis carried by the body, the handle including a forward portion extending beyond the pivot axis and within the body, punch anvil means carried by the forward portion of the handle and adapted to move in a first direction to actuate a predetermined character impressing portion of the die when the handle is pivotally displaced toward the handle extension, spring biasing means for urging the forward portion in the opposite direction from the first direction and a tape drive wheel including a tape gripping cylin-

drical surface and ratchet assembly rotatably supported concentrically about the first pivot axis, the combination therein of: an action multiplier-bar pivoted about a second pivot axis carried by the body forwardly of the first pivot axis, said multiplier-bar having a fulcrum forward end engaged by said second pivot axis and a rear pawl end for engaging said ratchet and a mid portion disposed and adapted to be engaged by the forward portion of the handle and moved thereby in said first direction when said handle is pivotally displaced toward the handle extension, and in the opposite direction when said handle is released, said rear, pawl end of said multiplier-bar being structurally adapted to perform a backstroke with respect to said ratchet when moved in said first direction, and a ratchet drive stroke when moved in said opposite direction by the force of said spring biasing means.

6. A tape embossing implement of the character adapted to be hand held and hand operated and to hold integrally a tape dispensing magazine, the implement comprising: a housing body defining a slip-in holding means for the tape magazine; a tape drive cylinder assembly disposed in tape receiving relationship with said tape magazine, said assembly being rotatably mounted within said body on a handle pivot axis carried thereby and including a tape driving cylindrical surface, a ratchet wheel rotationally coupled therewith, a rotary embossing die of the character to imprint a selected character when actuated by a punch anvil affixed to an axis carried by said body and being disposed orthogonally with respect to the direction of said pivot axis; a handle extension rigidly affixed to said body; a movable handle extending outwardly from said body to form in cooperation with said handle extension a pair of substantially parallel, spaced hand grips of the character to be grasped operatively by one hand, said movable handle being pivotally mounted on a first fulcrum formed by said handle pivot axis and having a forward portion extending beyond said first fulcrum into said body, said forward portion including a punch anvil extending toward said selected character of said rotary die and being disposed to actuate it when said hand grips are pivotally displaced toward each other causing said forward portion to move in a first tangential direction; handle biasing spring means connected between said handle and said body to urge said body away from said handle extension; a handle action multiplying-bar extending from a second fulcrum carried by said body and disposed forwardly of said first fulcrum to a ratchet pawl end which in ratchet actuating cooperation engages said ratchet wheel, said second fulcrum being formed by a pin member disposed transversely to the length of said multiplying bar; movable supporting means connected to said multiplying bar and including said pin member whereby said multiplying bar has a freedom of longitudinal displacement; multiplying-bar spring means connected between said multiplying-bar and said body for urging said multiplying-bar in said freedom of longitudinal displacement toward said ratchet wheel; and a multiplying-bar engaging means disposed on said forward portion of said handle for engaging said multiplying-bar at a point between its ends for moving said multiplying bar in said first direction when said forward portion is moved in said first direction, thereby to achieve a back stroke for said pawl end with respect to said ratchet.

7. A tape embossing implement of the character adapted to be hand held and hand operated and to hold integrally a tape dispensing magazine, the implement comprising: a housing body defining a slip-in holding means for the tape magazine; a tape drive cylinder assembly disposed in tape receiving relationship with said tape magazine, said assembly being rotatably mounted within said body on a handle pivot axis carried thereby and including a tape driving cylindrical surface, a ratchet wheel rotationally coupled therewith; a rotary embossing die of the character to imprint a selected character when actuated by a punch anvil affixed to an axis carried by said body

and being disposed orthogonally with respect to the direction of the axis of said magazine; a handle extension rigidly affixed to said body; a movable handle extending outwardly from said body to form in cooperation with said handle extension a pair of substantially parallel, spaced hand grips of the character to be grasped operatively by one hand, said movable handle being pivotally mounted on a first fulcrum formed by said handle pivot axis and having a forward portion extending beyond said first fulcrum into said body, said forward portion including a punch anvil extending toward said selected character of said rotary die and being disposed to actuate it when said hand grips are pivotally displaced toward each other causing said forward portion to move in a first tangential direction; handle biasing spring means connected between said handle and said body to urge said body away from said handle extension; a handle action multiplying-bar extending from a second fulcrum carried by said body and disposed forwardly of said first fulcrum to a ratchet pawl end which in actuating cooperation engages said ratchet wheel, said second fulcrum being formed by a pin member disposed transversely to the length of said multiplying-bar; movable supporting means for said multiplying-bar and including said pin member whereby said multiplying-bar has a freedom of longitudinal displacement with respect to said body; multiplying-bar spring means connected between said multiplying-bar and said body for urging said multiplying-bar in said freedom of longitudinal displacement toward said ratchet wheel; a multiplying-bar first engaging means disposed on said forward portion of said handle for engaging said multiplying bar at a point between its ends for moving said multiplying-bar in said first direction when said forward portion is moved in said first direction, thereby to achieve a back stroke for said pawl end with respect to said ratchet; and a multiplying-bar second engaging means affixed to said forward portion of said handle for moving said multiplying-bar in a direction opposite to said first direction when said forward portion is rotated by the release and spreading of said hand grips, thereby to achieve a single, drive stroke for said pawl end with respect to said ratchet.

8. A tape embossing implement of the character adapted to be hand held and hand operated and to hold integrally a tape dispensing magazine, the implement comprising: a housing body defining a slip-in holding means for the tape magazine and a tape feed tube having an output end and communicating from the magazine output; a tape drive cylinder assembly disposed contiguously to said feed tube output end in tape receiving relationship therewith, said assembly being rotatably mounted within said body on a handle pivot axis carried thereby and including a tape driving cylindrical surface, a ratchet wheel rotationally coupled therewith, and a manual advance-reverse knob rotationally coupled thereto and extending externally of said body; a rotary embossing die of the character to imprint a selected character when actuated by a punch anvil affixed to an axis carried by said body and being disposed orthogonally with respect to the direction of the axis of said magazine; a handle extension rigidly affixed to said body and having a length adequate for the hand grasp of the operator; a movable handle extending outwardly from said body to form in cooperation with said handle extension a pair of substantially parallel, spaced hand grips of the character to be grasped operatively by one hand, said movable handle being pivotally mounted on a first fulcrum formed by said handle pivot axis and having a forward portion extending beyond said first fulcrum into said body, said forward portion including a punch anvil extending toward said selective character of said rotary die and being disposed to actuate it when said hand grips are pivotally displaced toward each other causing said forward portion to move in a first tangential direction; stopping means carried by said body for limiting the spacing of said hand grips; handle biasing spring means connected between said handle and said

body to urge said body toward said stopping means and away from said handle extension; a handle action multiplying-bar extending from a second fulcrum carried by said body and disposed forwardly of said first fulcrum to a ratchet pawl end which in ratchet actuating cooperation engages said ratchet wheel, said second fulcrum being formed by a pin member having a predetermined effective diameter and being disposed transversely to the length of said multiplying-bar, said multiplying-bar being relieved near its fulcrum to define a pin engaging opening therethrough having a dimension along the length of said multiplying-bar which is significantly greater than said effective diameter, said pin member being disposed through said opening whereby said multiplying-bar has a freedom of longitudinal displacement; multiplying-bar spring means connected between said multiplying-bar and said body for urging said multiplying-bar, in said freedom of longitudinal displacement, toward said ratchet wheel; a multiplying-bar first engaging means disposed on said forward portion of said handle for engaging said multiplying-bar at a point between its ends for moving said multiplying-bar in said first direction when said forward portion is moved in said first direction, thereby to achieve a back stroke for said pawl end with respect to said ratchet; a multiplying-bar second engaging means affixed to said forward portion of said handle for moving said multiplying-bar in a direction opposite to said first direction when said forward portion is rotated by the release and spreading of said hand grips, thereby to achieve a single, drive stroke for said pawl end with respect to said ratchet; resilient means carried by said body contiguously to said tape driving cylindrical surface for urging the embossing tape compressively thereagainst; and tape guide means carried by said body for feeding the tape from said drive assembly past said die.

9. A tape embossing implement of the character adapted to be hand held and hand operated and to hold integrally a tape dispensing magazine, the implement comprising: a housing body defining a slip-in holding means for the tape magazine and a tape feed tube having an output end and communicating from the magazine output; a tape drive cylinder assembly disposed contiguously to said feed tube output end in tape receiving relationship therewith, said assembly being rotatably mounted within said body on a handle pivot axis carried thereby and including a rubber-like tape driving cylindrical surface, a ratchet wheel rotationally coupled therewith, and a manual advance-reverse knob rotationally coupled thereto and extending externally of said body; a rotary embossing die of the character to imprint a selected character when actuated by a punch anvil extrinsic of said die affixed to an axis carried by said body and being disposed orthogonally with respect to the direction of the axis and magazine; a handle extension rigidly affixed to said body and having a length of extension just adequate for the hand grasp of the operator; a movable handle extending outwardly from said body to form in cooperation with said handle extension a pair of substantially parallel, spaced hand grips of the character to be grasped operatively by one hand, said movable handle being pivotally mounted on a first fulcrum formed by said handle pivot axis and having a forward portion extending beyond said first fulcrum into said body, said forward portion including a punch anvil extending toward said selective character of said rotary die and being disposed to actuate it when said hand grips are pivotally displaced toward each other causing said forward portion to move in a first tangential direction; stopping means carried by said body for limiting the spacing of said hand grips; handle biasing spring means connected between said handle and said body to urge said body toward said stopping means and away from said handle extension; a handle action multiplying-bar extending from a second fulcrum carried by said body and disposed forwardly of said first fulcrum to a ratchet pawl end which in ratchet actuating cooperation engages said

ratchet wheel, said second fulcrum being formed by a pin member having a predetermined effective diameter and being disposed transversely to the length of said multiplying-bar, movable supporting means for said multiplying-bar including said pin member whereby said multiplying-bar has a freedom of longitudinal displacement with respect to said body; multiplying-bar spring means connected between said multiplying-bar and said body for urging said multiplying-bar, in said freedom of longitudinal displacement, toward said ratchet wheel; a multiplying-bar first engaging means disposed on said forward portion of said handle for engaging said multiplying-bar at a point between its ends for moving said multiplying-bar in said first direction when said forward portion is moved in said first direction, thereby to achieve a back stroke for said pawl end with respect to said ratchet; a multiplying-bar second engaging means affixed to said forward portion of said handle for moving said multiplying-bar in a direction opposite to said first direction when said forward portion is rotated by the release and spreading of said hand grips, thereby to achieve a single, drive stroke for said pawl end with respect to said ratchet, resilient means carried by said body contiguously to said tape driving cylindrical surface for urging the embossing tape compressively thereagainst; tape guide means carried by said body for feeding the tape from said drive assembly past said die to an embossed tape output; and tape cutter means disposed on said body portion between said die and said embossing tape output.

10. A tape embossing implement of the character adapted to be hand held and hand operated and to hold integrally a tape dispensing magazine, the implement comprising: a housing body defining a slip-in holding means for the tape magazine and a tape feed tube having an output end and communicating from the magazine output; a tape drive cylinder assembly disposed contiguously to said feed tube output end in tape receiving relationship therewith, said assembly being rotatably mounted within said body on a handle pivot axis carried thereby and including a rubber-like tape driving cylindrical surface, a ratchet wheel rotationally coupled therewith, and a manual advance-reverse knob rotationally coupled thereto and extending externally of said body; a rotary embossing die of the character to imprint a selected character when actuated by a punch anvil extrinsic of said die affixed to an axis carried by said body and being disposed orthogonally with respect to the direction of said pivot axis; a handle extension rigidly affixed to said body and having a length of extension just adequate for the hand grasp of the operator; a movable handle extending outwardly from said body to form in cooperation with said handle extension a pair of substantially parallel, spaced hand grips of the character to be grasped operatively by one hand, said movable handle being pivotally mounted on a first fulcrum formed by said handle pivot axis and having a forward portion extending beyond said first fulcrum into said body, said forward portion including a punch anvil extending toward said selective character of said rotary die and being disposed to actuate it when said hand grips are pivotally displaced toward each other causing said forward portion to move in a first tangential direction; stopping means carried by said body for limiting the spacing of said hand grips; handle biasing spring means connected between said handle and said body to urge said body toward said stopping means and away from said handle extension; a handle action multiplying-bar extending from a second fulcrum carried by said body and disposed forwardly of said first fulcrum to a ratchet pawl end which in ratchet actuating cooperation engages said ratchet wheel, said second fulcrum being formed by a pin member having a predetermined effective diameter and being disposed transversely to the length of said multiplying-bar, said multiplying-bar being relieved near its fulcrum to define a pin engaging opening therethrough having a dimension along the length of said multiplying-bar which is signifi-

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cantly greater than said effective diameter, said pin member being disposed through said opening whereby said multiplying-bar has a freedom of longitudinal displacement determined by the difference in magnitude between said dimension of said opening and said effective diameter; multiplying-bar spring means connected between said multiplying-bar and said body for urging said multiplying-bar, in said freedom of longitudinal displacement, toward said ratchet wheel; a multiplying-bar first engaging means disposed on said forward portion of said handle for engaging said multiplying-bar at a point between its ends for moving said multiplying-bar in said first direction when said forward portion is moved in said first direction, thereby to achieve a back stroke for said pawl end with respect to said ratchet; a multiplying-bar second engaging means affixed to said forward portion of said handle for moving said multiplying-bar in a direction opposite to said first direction when said forward portion is rotated by the release and spreading of said hand grips, thereby to achieve a single, drive stroke for said pawl end with respect to said ratchet; resilient means carried by said body contiguously to said tape driving cylindrical surface for urging the embossing tape compressively thereagainst; tape guide means carried by said body for feeding the tape from said drive assembly past said die to an embossed tape output; tape cutter means disposed on said body portion between said die and said embossing tape output; window means formed by said housing body for viewing said embossed tape between said cutter means and said die; and ratchet engaging resilient detent means held by said body for positively indexing said tape drive cylinder assembly with respect to discrete, evenly-spaced positions along the length of the tape to be embossed.

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11. The invention according to claim 2 which further includes a tape engaging roller carried by said body on an axis parallel to said pivot axis for urging said tape into a gripping relationship with respect to said tape gripping cylindrical surface.

12. The invention according to claim 2 which further includes a manual tape advance knob rotationally coupled to said tape drive wheel, said knob being internally relieved to form a series of ball engageable detents along its inner periphery, and a spring mounted detent engaging means carried by said body in ball and detent relationship with said detents.

13. The invention according to claim 12 in which said spring mounted detent engaging means includes a circularly bent flat mounting spring affixed at one end to said body.

14. The invention according to claim 12 in which said spring mounted detent engaging means includes a hollow cylindrical member affixed to said body, a coil spring compressively disposed concentrically therewithin, and a ball disposed partially within said cylindrical member and urged outwardly into detent engagement with said knob.

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