United States Patent

[11] 3,561,353

[72] Inventor **Bernard J. Curran**
9407 Courvie, Detroit, Mich.

[21] Appl. No. **723,416**
[22] Filed **Apr. 23, 1968**
[45] Patented **Feb. 9, 1971**

[54] **PRINTING APPARATUS EMPLOYING EMBOSSED TYPE IN METALLIC FOIL**
8 Claims, 9 Drawing Figs.

[52] **U.S. Cl.** **101/65,** 101/27, 101/336
[51] **Int. Cl.** **B411 47/44,** B44b 5/00
[50] **Field of Search** 101/65, 369, 336, 60, 61, 269, 274, 27, 11, 21, 9, 10, 292

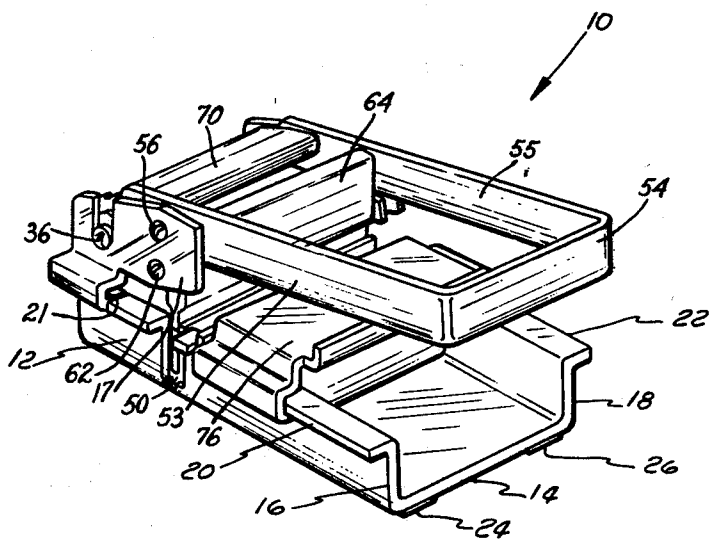
[56] **References Cited**

UNITED STATES PATENTS

34,378	2/1862	Spencer	101/301
1,850,922	3/1932	Chisholm	101/65
1,999,992	4/1935	Gibson	101/301
1,005,367	10/1911	Transue	101/65
1,209,416	12/1916	Duncan	101/65
1,345,794	7/1920	Massi	101/65X
1,801,593	4/1931	Dugdale	101/369
2,305,127	12/1942	Albers	101/369
2,854,921	10/1958	Frankle et al.	101/274X
2,864,306	12/1958	Hueber	101/65
2,925,773	2/1960	Kingsley	101/27X
2,982,205	5/1961	Maul	101/269

Primary Examiner—William B. Penn
Attorney—Hauke, Gifford and Pataldis

ABSTRACT: A printing apparatus for transferring an impression from a raised type printing plate such as an embossed card of the type commonly used as a credit or identification card or the like, to a piece of stock such as a match book cover, by employing a tape having a pressure removable metal coating on one face. The tape, stock and printing plate are supported between a pair of pressure bars which, when brought together, transfer the impressions of a raised or recessed type line from the printing plate to the stock. A conventional slug of type can also be employed as the source of the impression instead of the printing plate or card.



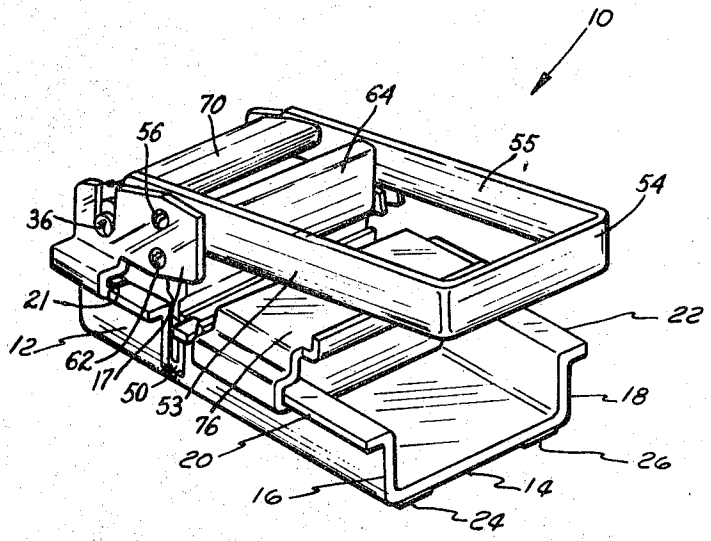


FIG.-1

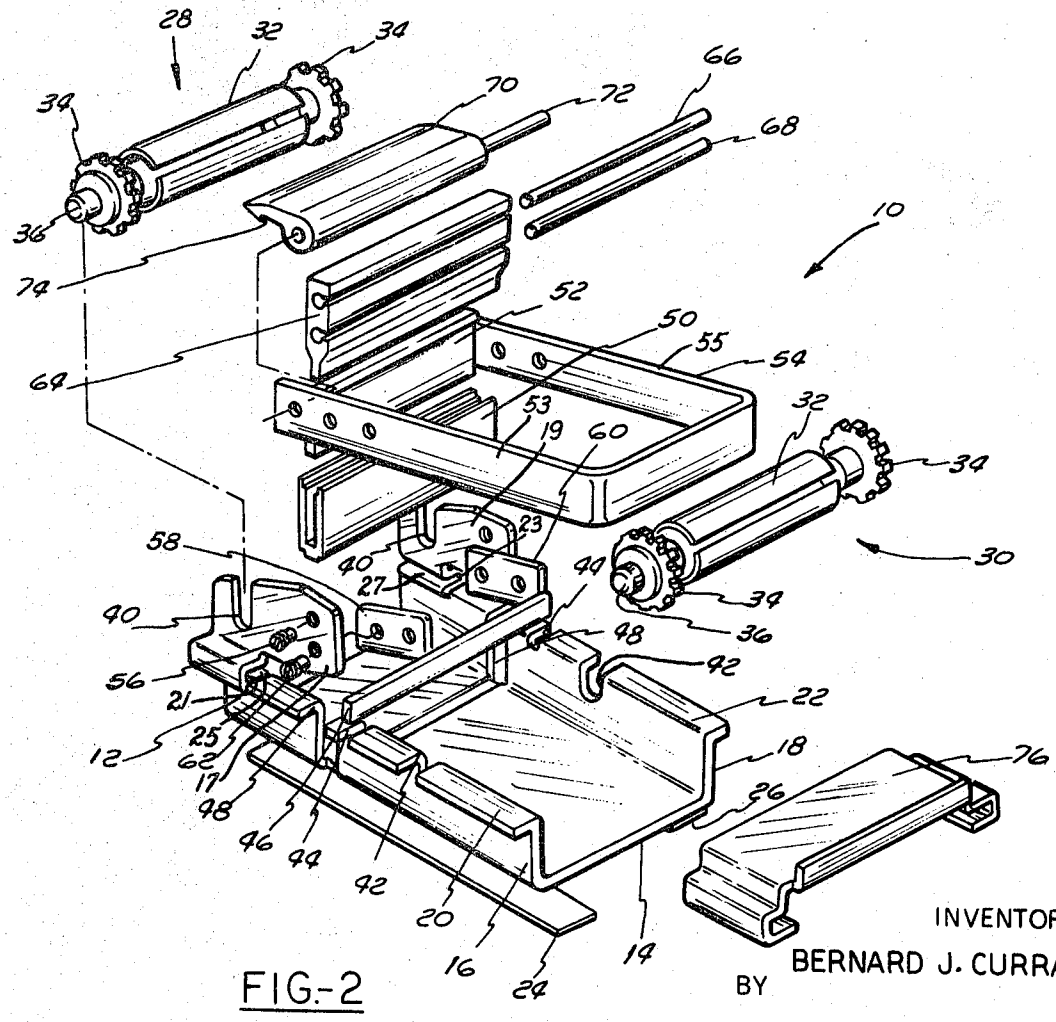


FIG.-2

INVENTOR.
BERNARD J. CURRAN
BY

Hauke Kraus Gifford & Patalidis
ATTORNEYS

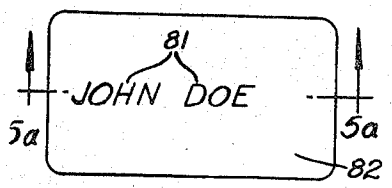


FIG.5



FIG.5a

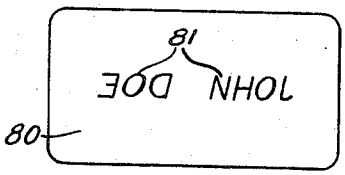


FIG.6

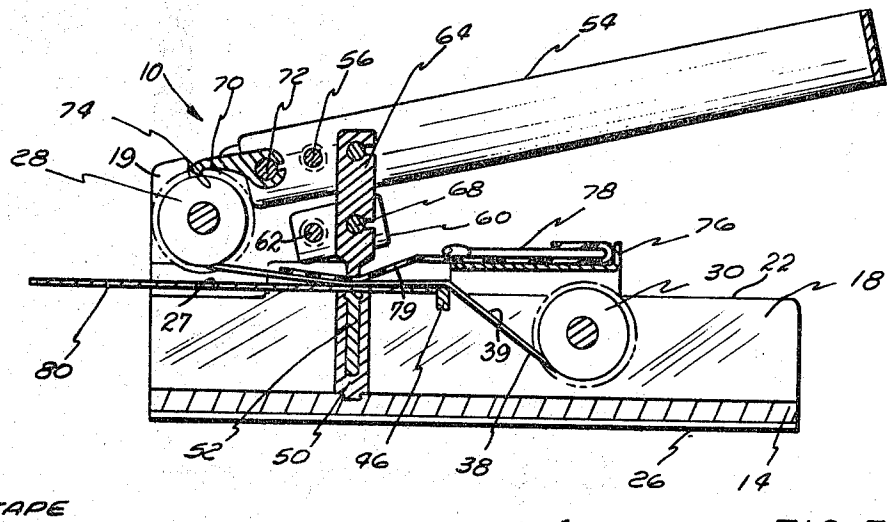


FIG-3

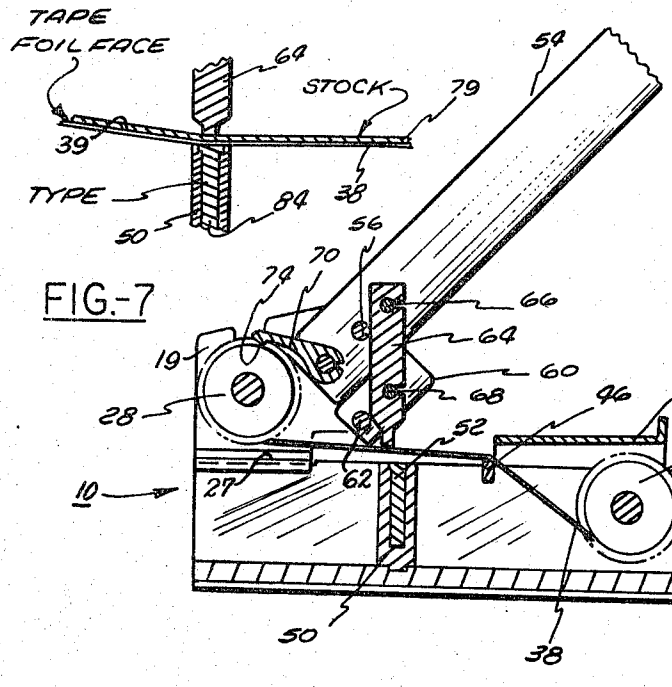


FIG.-7

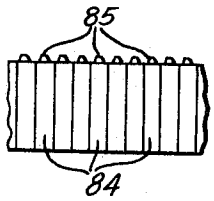


FIG.7a

FIG.-4

INVENTOR.
BERNARD J CURRAN
BY

Hauke Knox Gifford & Patchorko
ATTORNEYS

PRINTING APPARATUS EMPLOYING EMBOSSED TYPE IN METALLIC FOIL

BACKGROUND OF THE INVENTION

This invention relates to printing apparatus and more specifically to a printer for transferring an impression from a raised type printing plate to cardboard or paper stock by employing a tape having a pressure-removable metal foil on one face as a means for reproducing the impression on the stock.

Cold gold foil which essentially consists of a cellophane tape with a thin gold coating on one surface is commonly employed as a means for reproducing an impression on an object in gold by overlaying the object that is to receive the the impression with the coated surface of the foil and then applying a pressure on the uncoated surface of the foil. Conventionally manual methods have been employed for applying the pressure on the foil and for this reason the utilization of the foil for printing purposes has been limited.

SUMMARY OF THE INVENTION

The broad purpose of the present invention is to provide a printing device for mechanically transferring an impression from a relief surface to an object by employing a tape with a metallic coating or foil as the impression transfer means.

The preferred embodiment of the present invention, which will subsequently be described in greater detail, comprises a stamping type printer which employs a pair of pressure bars, one being fixedly mounted on a support and the second being mounted for motion toward and away from the fixed pressure bar. The tape is mounted in a roll around a feed roller and advanced between the two pressure bars to a takeup roller. The movable pressure bar is connected to a handle which is lowered and then raised in a printing stroke so that the bar approaches and then separates from the fixed bar. A ratchet mounted on the takeup roller connected with a pawl mounted on the handle so that as the handle is raised at the completion of each printing stroke, the takeup roller is rotated to advance the tape sufficiently between the pressure bars to dispose a freshly coated surface between the pressure bars for the subsequent print stroke.

When the two pressure bars are separated, the stock or object which is to receive the impression, and the source of the impression which may take the form of a card having a raised line of type such that one side of the card has an embossed surface and the reverse side an indented surface and which is disposed between the bars in such a manner that when the pressure bars are brought together, the impression of the type on the card is transferred to the stock or object through the tape. The bars only apply a sufficient pressure to the raised type to remove the metallic coating from the tape and to apply the removed coating to the stock or object.

In one embodiment of the preferred printer, the printing plates in the form of cards normally function as a means for identification with the name of the owner being on the card in the form of raised letters in reverse order, and the stock which receives the impression is in the form of paper match covers. In this application, the card is disposed between one of the pressure bars and the uncoated side of the tape with the stock being disposed between the other pressure bar and the coated side of the tape. When the two pressure bars are brought together, the name of the owner of the card is transferred in gold letters to the match book cover in regular order. In another application, the printer uses a card in which the type is raised from the body of the card with the letters arranged in regular order. The embossed card is disposed between one of the pressure bars and the stock with the ribbon being disposed between the other pressure bar and the stock with the coated surface facing the stock, thus upon application of pressure the type line will be transferred to the object in regular order as they appear on the card.

Still another embodiment of the preferred printer contemplates a slug of type having letters in relief which forms the source of the impression.

The preferred printer provides a number of advantages over conventional printers commonly employed for transferring information from printing plates such as embossed cards to some form of credit document. In this conventional type of printer, the transfer agent is carried on an ink pad with some form of roller means being employed to apply the printing pressure. To my knowledge, none of the conventional printing devices for transferring information from such cards employ a tape which must be advanced between each application of the printing force. This the preferred printer does automatically. Furthermore, I know of no printer that provides a mechanical means o for applying an impression to a surface by employing a "cold" metallic coated tape, using a pressure system.

Still other advantages of the present invention will readily occur to those skilled in the art to which the invention pertains upon reference to the following detailed description

DESCRIPTION OF THE DRAWINGS

The description refers to the accompanying drawings in which like reference characters refer to like parts throughout the several views and in which:

FIG. **1** is a perspective view of a printing device embodying the invention;

FIG. **2** is an exploded view of the printing device of FIG. **1**;

FIG. **3** is a sectional view of the preferred printing device showing the two pressure bars engaged in a printing stroke;

FIG. **4** is a view similar to FIG. **3** but with the pressure bars separated;

FIG. **5** is a face view of a printing plate such as an embossed card having a raised type line with the letters appearing in regular order;

FIG. **5***a* is a cross section through the printing plate shown in FIG. **5**;

FIG. **6** is a face view of a printing plate such as an embossed card having a raised type line with the letters appearing in e reverse order;

FIG. **7** is a fractional view of the pressure bar portion shown in the pressure stroke and employing slugs of type as the source of impression instead of a printing plate;

FIG. **7***a* is a separate view of an assembly of slugs of the type used in the arrangement in FIG. **7**.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Now referring to the drawings, a preferred printing device generally indicated at **10** is illustrated in FIGS. **1** and **2** as comprising a support **12** preferably formed of an aluminum extrusion. The support **12** has a channel-shaped portion which includes a flat base **14** and a pair of parallel sides **16** and **18** extending upwardly from the base **14** which terminate in a pair of laterally directed lips **20** and **22**. At the rear of the support **12** the sides **16** and **18** are provided with a pair of parallel upwardly extending brackets **17** and **19** which extend from the lip portions **20** and **22** respectively. The brackets **17** and **19** are disposed inwardly to form slots **21** and **23** respectively which are parallel aligned and which each have a surface **25** and **27** forming a continuation of the lips **20** and **22** respectively. The slots **21** and **23** as well as portions of the lips **20** and **22** form a sturdy rigid support for retainment of the printing plate or card during the impression stroke as will be subsequently described hereinafter. A pair of sections **24** and **26** of rubber tape are mounted on the under surface of the base **14** to provide antiskid means between the support **12** and a supporting surface (not shown) on which the printing device **10** is mounted.

A pair of roller means generally indicated at **28** and **30** are journaled on parallel axis for rotation on the support **12**. Each of the roller means comprises a slotted, tubular tape retainer **32** and a pair of ratchets **34** carried at each end of the retainer **32**. Each ratchet a has an axial extending pin section **36** which is journaled in suitable slots formed in the support **12**. The roller means **28** functions as a takeup roller while the roller means **30** acts as a feed roller with a roll of coated tape **38**,

best shown in FIGS 3 and 4, is unwound from the roller means 30 and wound onto the roller means 28. Both roller means have identical ratchets 34 so that either roller can function as the takeup roller.

The pins 36 of the roller means 28 are removably journaled in a pair of slots 40 formed in the brackets 17 and 19 of the support 12 and the pins 36 of the roller means 30 are journaled in a pair of slots 42 formed in the sides 16 and 18 of the support 12. Preferably, each ratchet 34 and its associated pin 36 are injection molded from a suitable plastic material such as nylon so that the roller means rotate with relative ease in their respective slots.

The sides 16 and 18 of the support 12 also have a pair of slots 44 adjacent to slots 42 for seating an elongated tape guide 46 over which the tape 38 passes as it moves from the roller means 30 to the roller means 28. Another pair of slots 48 in the side sides 16 and 18 of the support are adapted to receive a pressure bar support 50 which is supported on the base 14 of the support and has an upwardly facing slot for seating a lower pressure bar 52. The pressure bar 52 has an upper pressure face which is substantially flush with the upper surface of the pressure bar support and below the lower face of the tape 38 as it a passes from the guide 46 to the roller means 28.

A U-shaped handle 54 has a pair of legs 53 and 55 pivotally mounted by pins 56 to the front end of the brackets 17 and 19 of the support 12 so that the handle can be lowered toward the base 14 and then raised away from the base 14. A pair of links 58 and 60 are likewise pivotally mounted by pins 62 to the brackets 17 and 19 of the support 12 adjacent the ends of the handle 54. An elongated upper pressure bar 64 is pivotally connected by a pair of pins 66 and 68 between the legs 53 and 55 of the handle 54, and between the links 58 and 60. Links 58 and 60 are arranged to form a parallelogram linkage with the handle 54 and the pressure bar 64 so that as the handle 54 is raised, it moves the pressure face of the upper pressure bar 64 in directions both normal and parallel to the pressure face of the lower pressure bar 52. The lowering of the handle 54 in a printing stroke moves the upper pressure bar 64 downwardly with a sufficient mechanical advantage of a leverage ratio of about 13 to 1 toward the lower pressure bar 52 so that they engage opposite sides of the tape 38 with a force sufficient to transfer the coating on the tape to the stock.

It is to be noted that both the upper pressure bar 64 and the lower pressure a bar 52 have pressure surfaces which extend substantially the full width of the support 12 between the sides 16 and 18. Although the lower pressure bar 52 has a fairly narrow width, it is to be understood that the support 50 can be replaced by a support that will accommodate a lower pressure bar having a greater width in order to accommodate larger sized type.

A pawl 70 is pivotally mounted by a pin 72 between the lower ends of the legs 53 and 55 of the handle 54 and has a tooth portion 74 which rides on the teeth of both of the ratchets 34 carried on the roller means 28. The pawl 70 and the ratchets 34 are normally in continual engagement and are arranged so that as the handle 54 is raised, it causes the toothed portion 74 of the pawl to rotate the roller means 28 in a windup direction or clockwise as viewed in FIGS. 3 and 4 so as to advance the tape 38 between the printing faces of the two pressure bars. Thus it can be seen that the return motion of each printing stroke automatically advances the tape 38 to expose a fresh coated surface between the pressure bars 52 and 64.

A stock holder 76 is slidably mounted on the lips 20 and 22 of the support 12 and is adapted to support the stock which is to be printed. For purposes of illustration, the stock holder 76 is adapted to support a match book 78 having a cover flap 79 which is best shown in FIG. 3.

Referring to FIGS. 3 to 6 for a description of the operation of the preferred printer, the operating cycle is described for transferring a raised line of information from a printing plate such as card 80. The card 80 as best shown in FIG. 6 has letters 81 which are raised from the surface of the card arranged in reverse order. As shown in FIG. 3, the card 80 is disposed between the lower pressure bar 52 with the raised letters facing the upper pressure bar and the tape 38. The match book cover flap 79 which functions as the stock which is to receive the printed impression is disposed between the gold foil coated surface 39 of the tape 38 and the upper pressure bar 64. The printing plate or card 80 is securely held in position in the opposite slots 21, 23 (FIG. 2) resting on the parallel surfaces 25, 27 and lips 20 and 22 with its front end abutting against the tape guide 46 to thereby prevent distortion or displacement of the card during the printing stroke. The handle 54 is then lowered in a pressure on the lower pressure bar which is sufficient to transfer an impression of the raised letters 81 to the match book cover flap 79. This impression is in the form of gold letters which are imprinted on the match book cover flap 79 in regular order.

While maintaining the card 80 in position the handle 54 is then raised in a return stroke so as to separate the upper pressure bar 64 from the lower pressure bar 52. As the handle 54 is raised, the pawl 70 rotates the roller means 28 sufficiently to wind a small section of the tape 38 on the roller means 28 which advances the tape from the roller means 30 sufficiently to dispose a new fully coated surface of the tape above the lower pressure bar 52. The imprinted match book 78 is then removed and replaced by an unprinted match book and the operation repeated.

FIG. 5 illustrates a printing plate in the form of an embossed card 82 having a raised type arranged in regular order instead of reverse. As explained earlier, in this instance the printing plate or card 82 is supported directly on the pressure face of the lower pressure bar 52 with the raised letters facing the upper pressure bar 64. The stock 79 will be disposed between the card 82 and the downward facing coated surface 39 of the foil tape 38 so that during the printing stroke the upper pressure bar 64 applies pressure directly on the tape 38.

FIG. 7 illustrates the preferred printer with the lower pressure bar having been replaced by a number of slugs 84 of type which provides the source of the printing impression. As shown in FIG. 7*a* the individual slugs 84 are each provided with a raised letter, numeral or other indicia 85 and will be arranged in a row within the lower support 50 between the sides 16 and 18 in reverse reading order. In this arrangement, the tape 38 is disposed between the pressure bars with its uncoated surface adjacent the slugs 84 and its coated surface facing the upper pressure bar. The stock 79 is disposed between the coated surface of the tape 38 and the upper pressure bar 64. In this arrangement, lowering of the handle 54 in its pressure stroke stamps the impression from the slugs 84 onto the stock 79.

From the foregoing description it can be seen that I have described a novel printing device for transferring an impression of information formed in relief from either a printing plate, card or conventional slugs of type to a surface with the impression being formed in metallic letters, such as gold, which is removed from a tape having a coated surface of the metal. Each stroke of the device automatically advances another fully coated surface of the tape between the pressure faces of the pressure bars.

Although I have described but a few preferred embodiments of my invention, it is to be understood that various changes and revisions can be made therein without departing from the spirit of the invention or the scope of the appended claims.

I claim:

1. A stamping-type printer, comprising:

a longitudinal support having a base and upstanding parallel spaced sides, said sides having horizontally extending lip portions;

bracket means extending from each of said spaced sides of said support pivotally supporting a pressure applying lever means;

a pair of rollers;

first and second means respectively carrying one of said rollers rotatively on said support between said sides and the other of said rollers rotatively between said bracket means on spaced parallel axes disposed normal to the longitudinal axis of said support;

a ribbon of tape having pressure removable metal foil on one face thereof, said tape extending between said rollers for winding on one roller while unwinding from the other roller;

means on said support and said pressure applying lever means supporting a pair of aligned pressure bars on opposite sides of said tape for relative vertical movement towards and away from each other;

said support having means adjustably supporting an object to be printed between one pressure bar and the metal foil face of said tape;

each of said bracket means being provided with a longitudinal slot, each slot having a surface horizontally aligned with the top surface of said lip portion for supporting a printing plate in position between one of said pressure bars and the other face of said tape;

a tape guide bar between said sides of said support adapted for tensioning said tape between said pair of rollers and disposed such as to slightly extend beyond the upper edges of said sides to thereby provide an abutment means for said printing plate supported on said slot and lip portion surfaces; and

means intermittently advancing said tape between said pressure bars upon successive relative movement of said bars toward and away from each other by manipulation of said lever means.

2 The printer as defined in claim 1 in which said pressure bar supporting means on said support comprises a longitudinal member secured to said base between said sides and provided with a longitudinal slot, said slot being adapted to receive a stationary pressure bar, said pressure bar supporting means on said lever means comprises spaced pivot pins pivotally supporting a movable pressure bar and a parallelogram linkage pivotally secured to said support and said movable pressure bar to cause movement of said movable pressure bar towards and away from said stationary pressure bar in a substantially vertical direction upon manipulation of said lever means.

3. The printer as defined in claim 2 in which said lever means comprises a U-shaped handle having parallel disposed spaced leg portions, said movable pressure bar being pivotally disposed between said spaced leg portions.

4. The printer as defined inn in claim 1 in which said means intermittently advancing said tape comprises, a ratchet formed about the periphery of said one of said pair of rollers supported between said bracket means, said lever means pivotally supporting a pawl adapted for engagement with said ratchet such, that upon manipulation of said lever means said one of said pair of rollers will be rotated a predetermined amount by engagement of said pawl with said ratchet to thereby advance said tape a predetermined distance.

5. The printer as defined in claim 1, said metal foil of said tape being a gold foil.

6. A stamping-type printer, comprising:

a longitudinal support having a base and upstanding parallel spaced sides,

bracket means on said support pivotably supporting a pressure applying lever means;

means carrying a pair of rollers rotatably on said support between said sides on spaced parallel axes disposed normal to the longitudinal axis of said support;

a ribbon of tape having pressure removable metal foil on one face thereof, said tape extending between said rollers for winding on one roller while unwinding from the other roller;

a first pressure bar fixedly mounted on said support between said spaced sides on one side of said tape;

means on said pressure applying lever means supporting a second pressure bar on the opposite side of said tape for vertical movement toward and away from said first pressure bar;

said support having means adjustably supporting an object to be printed between one of said pressure bars and the metal foil face of said tape;

means for supporting a printing device in position between one of said pressure bars and the other face of said tape;

a ratchet formed about a portion of the periphery of one of said pair of rollers; and

a pawl pivotably supported by said lever means, said pawl adapted for engagement with said ratchet upon manipulation of said lever means for rotating said one of said pair of rollers a predetermined arcuate distance to thereby advance said tape a predetermined distance.

7. The printer as defined in claim 6 wherein said pressure bar supporting means on said lever means comprises spaced pivot pins pivotably supporting said second pressure bar and a parallelogram linkage pivotably secured to said support and said second pressure bar to cause movement thereof toward and away from a said fixedly mounted first pressure bar in a substantially vertical direction upon manipulation of said lever means.

8. The printer as defined in claim 7 in which said lever means comprises a U-shaped handle having parallel spaced leg portions, said second pressure bar being pivotably disposed between said spaced leg portions, the ends of said leg portions being carried by said bracket means, said one of said pair of rollers being supported between said bracket means on an axis which is normal to the longitudinal axis of said support and parallel to and elevated above the axis of said other of said pair of rollers, said one of said rollers being disposed proximate the end of one of said leg portions of said U-shaped handle, said pawl being carried by the end of one of said leg portions and cooperating with the ratchet formed on said one of said rollers to rotate said last mentioned roller when said U-shaped handle is operated to move said second pressure bar away from said first pressure bar.