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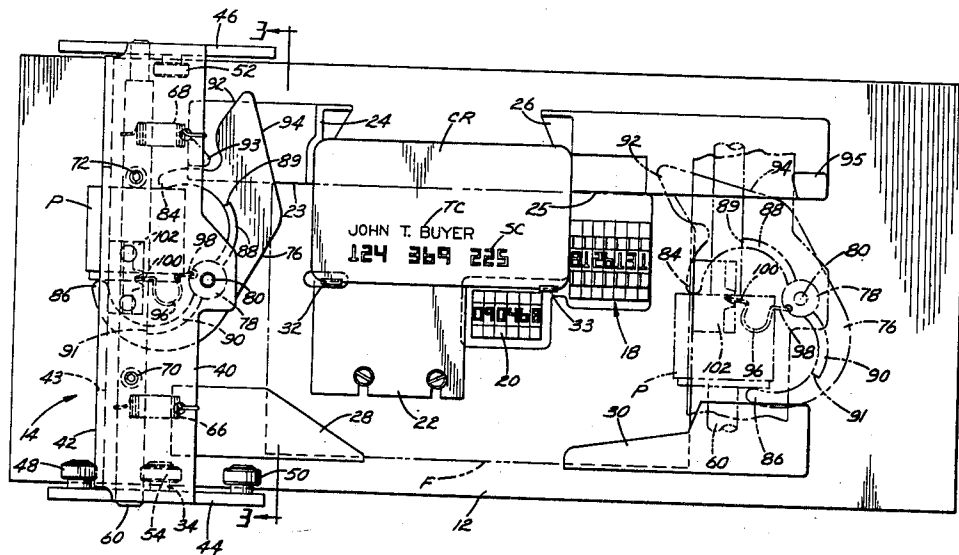
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[54] **PRINTING MACHINES WITH SHIFTING ROLLER PLATEN**  
 7 Claims, 4 Drawing Figs.

[52] U.S. Cl. .... **101/269,**  
 101/56, 101/252  
 [51] Int. Cl. .... **B41f 3/04**  
 [50] Field of Search ..... 101/56,  
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[56] **References Cited**  
**UNITED STATES PATENTS**  
 323,024 7/1885 Davis ..... 101/272  
 1,179,489 4/1916 Wright ..... 101/273X

**ABSTRACT:** Imprinting of forms with fixed and variable data from printing elements comprising two distinct groups of characters. A bed retains the printing elements and the form, and a roller platen moves from a home position in a first path across the form to an actuated position and back to home position in a second path across the form to perform a printing cycle. The roller platen is shiftable between the first and the second path such that as the platen is moved in the first path it is operative to imprint a single line only of one group of characters, and as it is moved in the opposite direction in the second path it is operative to imprint a single line only of the other group of characters, to thereby compensate for imprinting pressure as a result of rolling line contact of the platen with only a single line of characters without the platen reaching any adjacent line of characters.





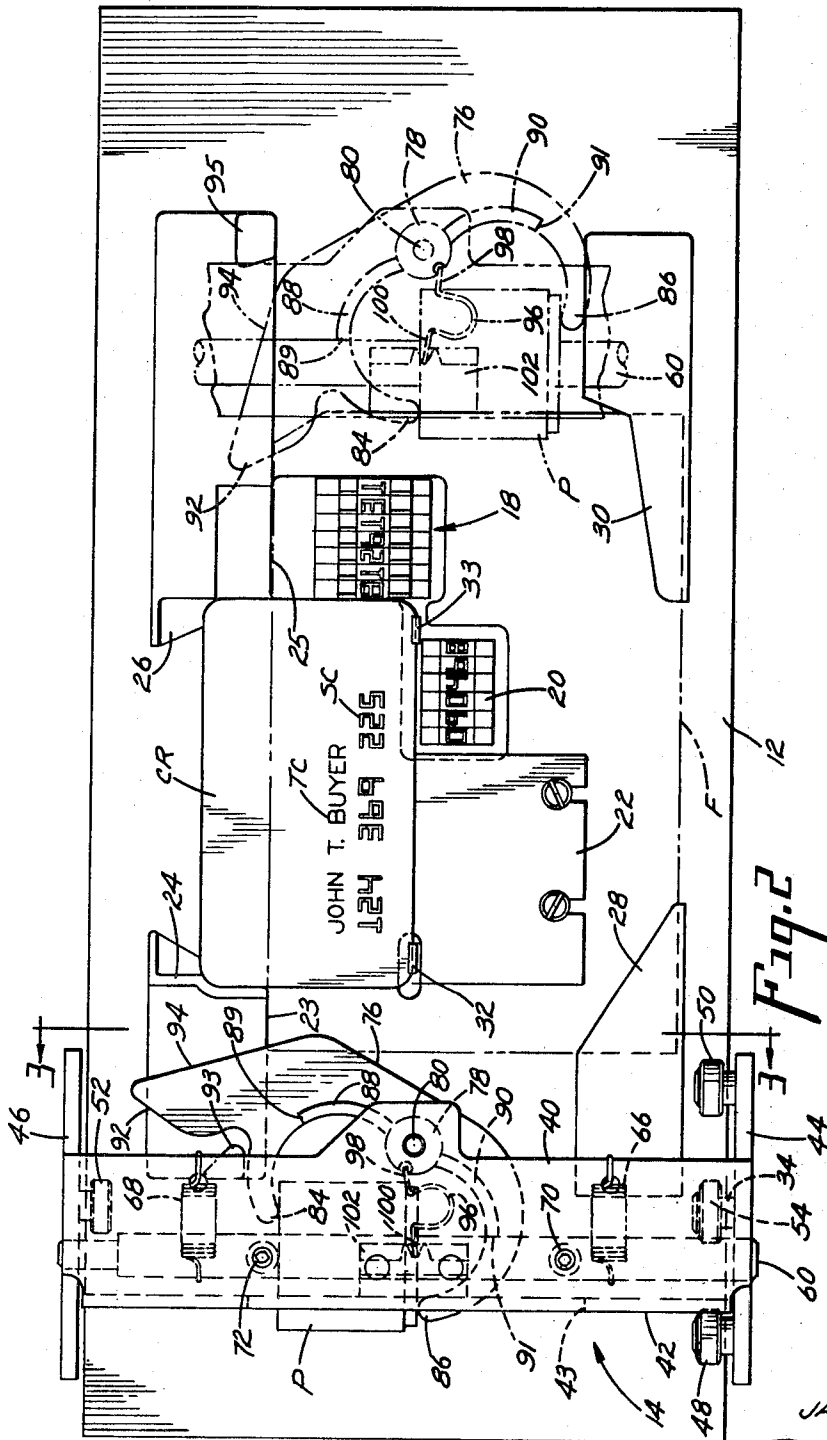


Fig. 2

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## PRINTING MACHINES WITH SHIFTING ROLLER PLATEN

### BACKGROUND OF THE INVENTION

The present invention relates to a printing machine and relates more particularly to a recorder for imprinting a restricted group of characters which are of critical importance in the quality of their imprinting, in close proximity to another group of characters which are of a less critical nature. The less critical data, for example, may include the name and address of a customer and his account number. The critical group of characters is exemplified by a machine scannable portion of the transaction.

Advantageously, the account number on the credit card and the numerals on the variable amount print wheels may be stylized characters of the kind used for optical character recognition (OCR) machine reading or magnetic ink character recognition (MICR) machine reading. In this way, the forms imprinted on the data recorder can be processed accurately and rapidly with machine data processing equipment.

Although the use of scannable data ease greatly increased the speed and efficiently with which the imprinted documents can be processed, a considerable amount of difficulty has been encountered in the imprinting of the stylized characters on the forms. In this connection, because of the critical tolerances required by the sensing equipment to properly read the scannable characters, it is necessary that the characters be positioned within a certain limited area on the form, that they be of uniform density to provide a strong signal when being sensed, and that they be free of ragged or jagged outlines which might cause spurious signals resulting in erroneous reading operations. The present invention will be described in terms of OCR characters, but it will be understood that characters intended for MICR and other types of critical reading characters are also comprehended.

Heretofore several improvements have been made to data recorders for imprinting forms and documents with machine-scannable data. The improvements to the data recorders comprises such things as compensating platens or anvils to obtain a uniform degree of printing pressure even though the thickness of the embossed card and/or the form may vary from one application to another.

Still other devices include the use of dual roller platens which are independently operative to imprint one group of characters with one of the platens when the platens are moved in a first direction across the form, and to imprint the other group of characters with the other platen when the platens are moved in the opposite direction across the form, as shown in U.S. Pat. No. 3,272,120, issued to Johnson, dated Sept. 13, 1966. In particular one of the platens is lowered into printing relation with a single line only of stylized embossed characters when the platens are moved in the first direction, and the platen is then raised and the other platen is lowered into printing relation with the other embossed data during the return movement of the platens to their start position, such that the printing pressure on the embossed characters in one line is not influenced by any parallel lines of embossed characters to thereby provide uniformity of pressure thus applied to the form.

Although the foregoing improvements have met with a certain amount of success, it is an object of the present invention to further advance current practices of imaging form sets with characters having a high degree of clarity and outline accuracy through the use of small data recorders.

Another object of the present invention is to provide a data recorder for imprinting form sets from a printing plate having conventional embossed characters thereon as well as embossed coded data, and from settable print wheels for imprinting variable coded data, in such a way that the form set is imprinted to give an impression whose sharpness and clarity meets machine reading requirements.

Another object of the present invention is to provide a data recorder including printing pressure compensating means

comprising an axially shiftable roller platen arranged to imprint a form from a first group of printing elements and to roll therealong from end to end without reaching any adjacent line of type in a second group of printing elements, and thereafter the platen is shifted axially to a position to imprint the form with only the second group of printing elements when the platen is restored to its start position.

It will be found that impressions made in this manner have a quality substantially equivalent to imprints made directly from inked type and, when the imprinted form is used as an input document for data processing equipment, the impression thereon will be accurately interpreted by the data processing equipment.

Other objects, features and advantages will appear hereinafter as the description proceeds.

### IN THE DRAWINGS

FIG. 1 is a perspective view of a printing machine constructed in accordance with the present invention with the platen carriage handle removed to an exploded view position; FIG. 2, on sheet 2, is a plan view with the handle removed showing the positions of the printing elements; and showing a platen-shifting mechanism in its two extreme positions; FIG. 3 is a section taken on line 3-3 of FIG. 2; and FIG. 4 is a section, partially broken away, taken on the line 4-4 of FIG. 3.

### DESCRIPTION OF THE PREFERRED EMBODIMENT

The platen construction of the present invention provides a relatively simple arrangement which can be incorporated in various types of data recorders. For purposes of this specification, the novel arrangement is described as being incorporated in a machine such as shown and described, for example, in U.S. Pat. No. 3,405,634, issued to Maul et al., dated Oct. 15, 1968. To the extent that it assists in understanding the description of the invention to be set forth in detail hereinbelow, the disclosure in the patent is incorporated herein.

The data recorder of the present invention is shown generally at 10 in FIG. 1, and is adapted to produce impressions on a form from a credit card or printing plate CR provided with embossed reading-type characters TC (see FIG. 2) and stylized embossed characters SC in the form of OCR characters. Since the data recorder of the present invention, with the exception of the platen roller mechanism, is substantially the same as disclosed in the aforementioned U.S. Pat. No. 3,405,634, only a brief description of the machine will be given herein.

As shown in FIG. 1, the data recorder comprises a base B having mounted thereon an anvil or bed 12, a roller platen carriage indicated generally at 14 adapted to be moved in a path across the bed 12 to effect an imprinting operation, and a keyboard including keyset levers indicated generally at 16 for manually positioning variable data print wheels indicated generally at 18.

With reference to FIG. 2, the bed 12 of the data recorder may also be provided with a dater 20 and an auxiliary plate 22. Plate 22 may be for such purposes as station identification. The dater and/or the station plate may also be provided with stylized characters such as OCR characters. The embossed credit card CR is positioned face up on the surface of the bed 12 and is retained by corner guides 24 and 26 and spring gauges 32 and 33. A form F to be imprinted, is positioned on the bed 12 and overlies the print wheels 18, dater 20, auxiliary plate 22 and that portion of the credit card CR bearing embossed data. The form is properly registered and held in place by surfaces 23 and 25 and corner guides 28 and 30.

The platen carriage 14 is similar to that disclosed in the above U.S. Pat. 3,405,634 and includes an inverted U-shaped frame comprising a top 40, a depending backplate 42 (see FIG. 4) and depending legs 44 and 46. The leg 44 is provided with a pair of rollers 48 and 50 (FIGS. 2 and 3) and the leg 46 is provided with a single roller 52 (FIGS. 2 and 4) such that

the rollers 48 and 50 are in rolling contact with the upper surface of the bed 12 at one longitudinal margin thereof, and the roller 52 is in rolling contact with the upper surface of the bed 12 at the other longitudinal margin thereof. The leg 44 is also provided with a roller 54 mounted on an eccentric stud 34, and the leg 46 is provided with a roller 56 mounted on an eccentric stud 36, such that the roller 54 is in rolling contact with the lower surface of the bed 12 at the margin below the rollers 48 and 50, and the roller 56 is in rolling contact with the lower surface of the bed 12 at the margin below the roller 52. Thus, the rollers 48, 50, 52, 54 and 56 support and guide the platen carriage 14 in its movement from a home position across the bed to an actuated position and back to home position to perform a printing cycle. The eccentric studs 34 and 36 permit adjustment of the rollers 54 and 56 respectively in relation to the rollers 48, 50 and 52, to obtain proper positioning of the rollers against the bed for travel of the platen carriage 14 through a printing cycle with smooth, accurately guided motion free of detrimental play.

The novel arrangement of the present invention pertains to a roller platen mechanism which will roll in one path in a first direction, and shift to roll in a laterally spaced path on return in the opposite direction. As best shown in FIG. 3, a roller platen P is rotatably and slidably mounted on a shaft 60 supported in vertically elongate openings 62 and 64 provided in the legs 44 and 46 respectively of the platen carriage 14. The shaft is held against endwise displacement by a cover or handle 65 (FIG. 1). Handle 65 is mounted on the platen carriage and is adapted to be grasped by the operator for moving the carriage through a printing cycle. A pair of springs 66 and 68 are provided for urging the shaft 60 upwardly in the elongate openings 62 and 64, and a pair of adjusting screws 70 and 72 acting on the shaft and against the bias of the springs afford vertical adjustment of the shaft to position the roller platen at a proper level above the bed 12 to obtain the required printing pressure of the roller platen in relation to the printing elements and the forms to be imprinted.

As shown in FIGS. 2, 3 and 4, the backplate 42 of the platen carriage 14 is provided with an opening 43 to provide clearance for the roller platen when it is at the home position, or at the left end of the bed 12 as viewed in FIGS. 1, 2 and 4. A platen-shifting means provides for axially sliding the platen P on the shaft 60 from the full line position at one end of the bed to the dotted line position at the opposite end, and back to the full line position, as shown in FIG. 2. The shifting means comprises a yoke 76 mounted on the platen carriage 14 and bodily movable therewith.

The yoke 76 includes a vertical post 78 for pivotally mounting the yoke on a pin 80 fixed in and depending from the top 40 of the platen carriage. The yoke is retained on the pin by a retaining member 82. The yoke further includes a pair of arcuate arms 84 and 86 each in contact with an end of the roller platen.

An overcenter U-shaped spring 96 is provided to retain the roller platen in either of its two positions on the shaft 60 and includes a pair of outwardly formed ears 98 and 100 for mounting the spring. As shown in FIG. 2, the ear 98 is held in a recess provided in the post 78 of the yoke 76, and the ear 100 is held in a groove provided in a block 102 fastened to the underside of the top 40 of the platen carriage.

### OPERATION

With reference to FIG. 2, wherein the printing elements and a form to be imprinted are positioned on the bed 12 and the platen carriage 14 is at the home position, the yoke 76 and the roller platen P are in the full line positions held by the spring 96 urging the yoke in a clockwise direction. As the platen carriage is moved to the actuated position, from left to right, the spring continues to hold the yoke in the full line position as the platen travels in a first path across the bed to imprint the form from the credit card CR and the print wheels 18.

As the platen carriage approaches the actuated position, a cam follower edge 94 of the yoke 76 strikes a cam 95 provided on the corner guide 26, causing the yoke to be rotated in a counterclockwise direction thereby causing the arm 84 of the yoke to act against the end of the roller platen and axially shift it to the dotted line position. Rotation of the yoke is arrested when a stop surface 89, provided on an upstanding rib 88 on the yoke, abuts the shaft 60, at which time the spring has been snapped to overcenter position to effectively retain the roller platen in the dotted line position during return movement of the platen carriage from the actuated to the home position.

During the return movement of the carriage, the spring continues to hold the yoke in the dotted line position as the roller platen travels in a second path across the bed to imprint the form from the characters provided on the dater 20 and the station plate 22. As the carriage approaches the home position, a cam follower edge 92 of the yoke 76 strikes a cam 93 provided on the corner guide 24, causing the yoke to be rotated in the opposite direction and causing the arm 86 of the yoke to act against the other end of the roller platen to axially shift it back to the position shown in full lines. Rotation of the yoke is arrested when a stop surface 91, provided on an upstanding rib 90 on the yoke, abuts the shaft 60, at which time the spring has been snapped overcenter in the opposite direction to retain the roller platen in the full line position in readiness for another printing operation.

High-quality impressions are obtained with the device of the present invention as a result of the use of a shiftable roller platen assembly effective to compensate for printing pressure, wherein the printing of characters is accomplished by rolling the platen in a first path in one direction over a group of printing elements, and then shifting the platen to a second path and rolling it in the opposite direction over another group of printing elements. In this way, the printing pressure on the characters of one group is not influenced by any adjacent embossed lines of characters of the other group. Accordingly, the uniformity of the impression made from the OCR characters, utilizing a single roller platen movable through two separate printing paths, is of a quality such that when the imprinted form is used as an input document for data processing equipment, the impression thereon has the clarity and sharpness to afford accurate interpretation by the data processing equipment.

From the foregoing, it will be appreciated that the novel platen-shifting arrangement of the present invention is effective to produce extremely high quality impressions on carbon interleaved forms and, more particularly, impressions of OCR stylized characters.

I claim:

1. A data recorder comprising:

a bed for holding printing elements and a form to be imprinted;  
a platen carriage movable across the bed from a home position to an actuated position and back to home position to perform a printing cycle;  
a roller platen;  
means for axially shifting and rotationally supporting the roller platen on the platen carriage for movement in a first direction path in printing relation with the form, and in the opposite direction in a second path axially spaced from the first path in printing relation with the form; and  
shifting means responsive to movement of the platen carriage through said printing cycle for moving the roller platen between the first and the second paths at the actuated position.

2. A data recorder as set forth in claim 1 in which the shifting means comprises a yoke pivotally mounted on the platen carriage and actuatable to engage and axially move the roller platen; and

means adjacent each of the home and the actuated positions of the platen carriage for actuating the yoke.

3. A data recorder as set forth in claim 1 which further includes resilient means cooperable with the shifting means for

holding the roller platen in either the first or the second path during a printing cycle.

4. A method of making an impression on a form from two groups of embossed printing elements which utilizes a platen carriage movable in opposite directions between a home and an actuated position and having a roller platen rotatably supported and axially shiftable thereon, rolling the platen in a first path in printing relation to one group of printing elements when the platen carriage is moved in one direction, axially shifting the roller platen from the first path to a second path after the platen carriage has passed said first group of printing elements, and rolling the platen in the second path in printing relation to the other group of printing elements when the platen carriage is moved in the opposite direction.

5. A data recorder comprising:

a bed for holding printing elements and a form to be imprinted; a platen carriage movable across the bed in one direction to an actuated position and return in the opposite direction to a home position to perform a printing cycle;

a roller platen;

means for axially shifting and rotationally supporting the roller platen on the platen carriage with its axis extending transversely of the direction of platen carriage motion for movement in a first path in printing relation with one portion of the printing elements and the form, and in a second path axially spaced from the first path in printing relation with another portion of the printing elements and the form;

shifting means for axially moving the roller platen to one or the other of the first and the second paths; and

means adjacent the home and the actuated positions of the platen carriage for operating the shifting means, whereby the roller platen is in the first path during movement of the platen carriage in one direction and in the second path during movement of the platen carriage in the other direction.

6. A data recorder comprising:

a bed for holding printing elements and a form to be imprinted;

a platen carriage movable forwards across the bed from a home position to an actuated position and back to home position to perform a printing cycle;

a roller platen;

means supporting the roller platen on the platen carriage for rotation about an axis transverse to the direction of platen carriage movement and also for shifting along that axis;

shifting means responsive to movement of the platen carriage through said printing cycle for moving the roller platen axially between movements forward and back over the printing elements whereby in a printing cycle the roller platen moves forward in a first path in printing relation with the form, and back in a second path axially spaced from the first path in printing relation with the form.

7. A data recorder comprising:

a bed for holding printing elements and a form to be imprinted;

a platen carriage movable forwards across the bed from a home position to an actuated position and back to home position to perform a printing cycle;

a roller platen;

means supporting the roller platen on the platen carriage for rotation about an axis transverse to the direction of platen carriage movement and also for shifting along that axis;

means on the platen carriage for axially moving the roller platen;

means adjacent the home and the actuated positions of the platen carriage for operating the last-mentioned means, whereby in a printing cycle the roller platen moves forward in a first path in printing relation with the form, and back in a second path axially spaced from the first path in printing relation with the form.

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