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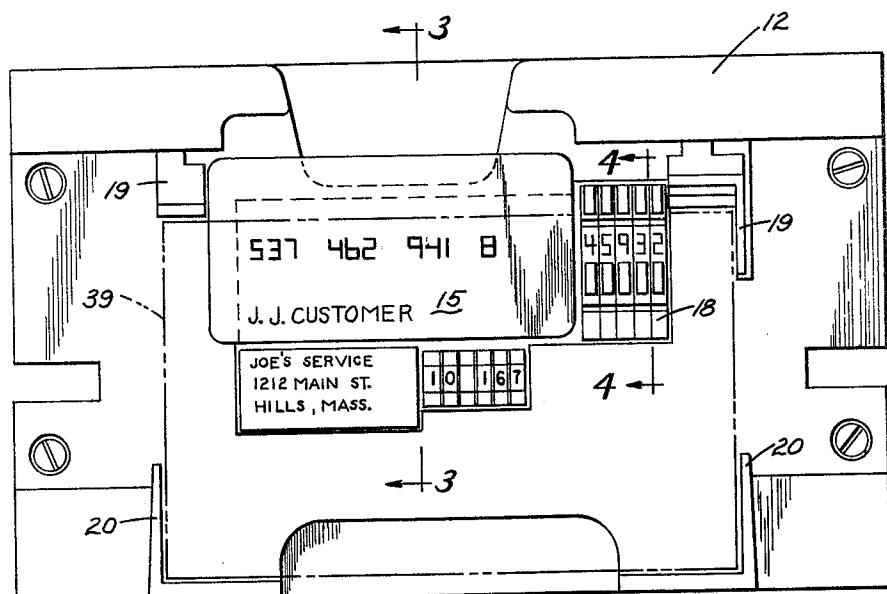
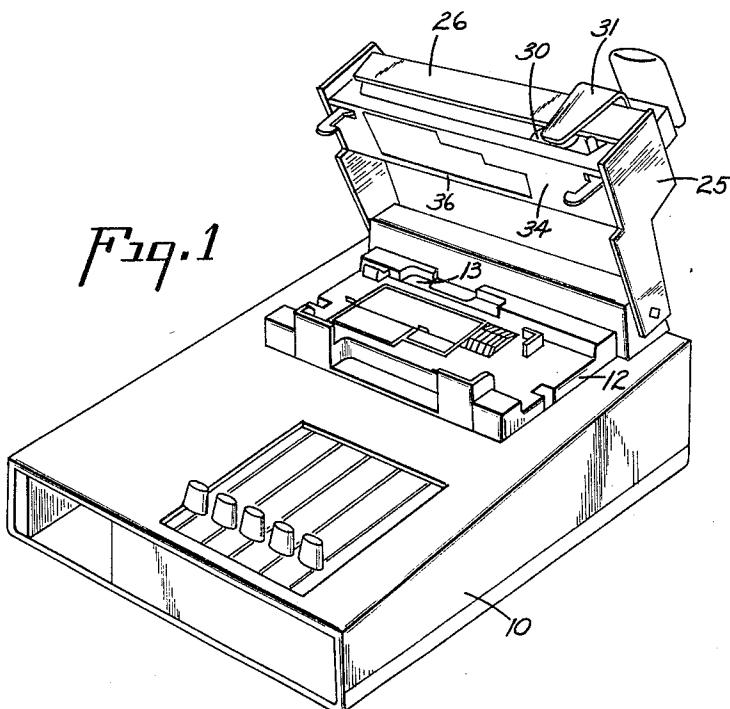
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3,481,269

PRINTING PRESSURE CONTROL SPACER MEANS FOR DATA ENCODERS

Filed Sept. 15, 1967

2 Sheets-Sheet 1



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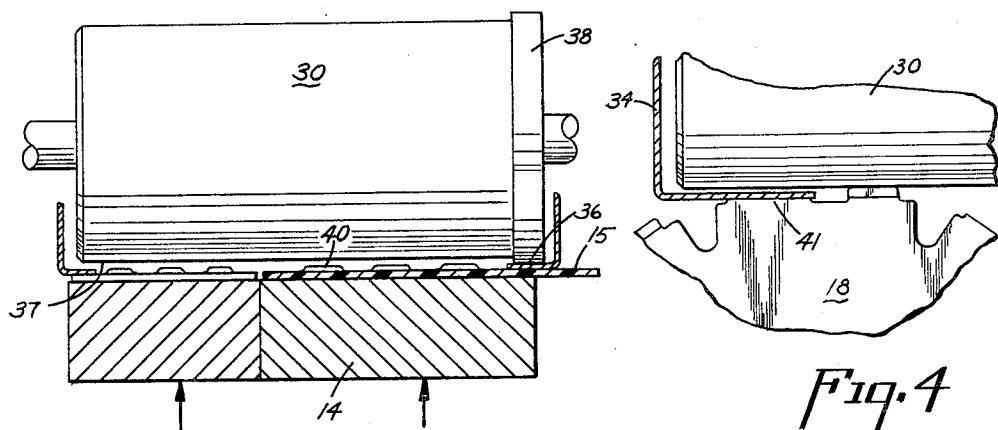


Fig. 3

Fig. 4

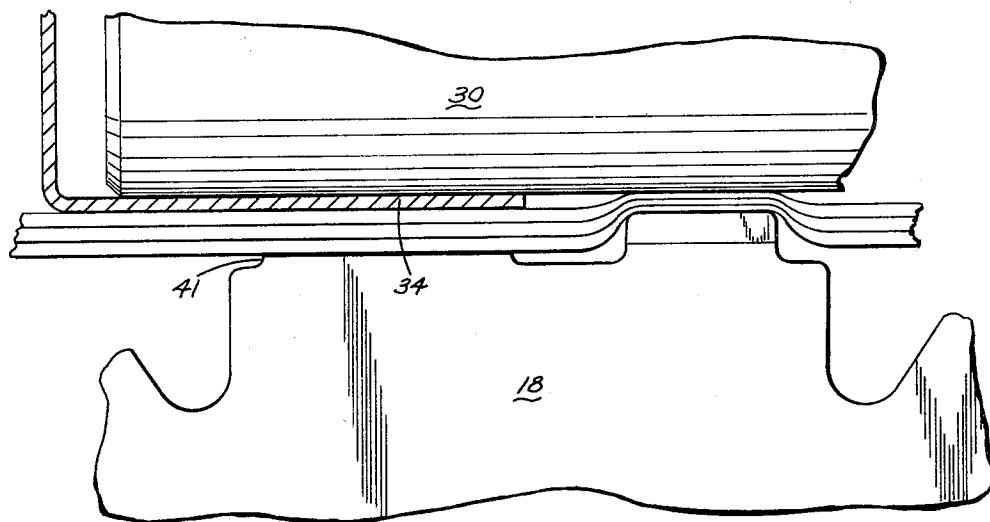


Fig. 5

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PRINTING PRESSURE CONTROL SPACER MEANS FOR DATA ENCODERS

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4 Claims

ABSTRACT OF THE DISCLOSURE

A data encoder having a bed, and a closeable platen track pivotally carried by the bed. The track carries a form set mask which clamps the form to the bed to prevent slippage. This mask clamp is used to advantage as a platen spacing means, in conjunction with the form set itself in some instances, or a bearer rim on the platen in other instances, or both.

BACKGROUND OF THE INVENTION

Refer to U.S. Patent 3,277,822 as a teaching of the general type original source data encoder under consideration, and its purpose. Such teaching is not related in the inventive sense, but is related in general use.

The data encoder uses a temporary printing plate, colloquially known as a credit card, for information pertaining solely to a given transaction. The plate is held in a position to be traversed by a roller platen of the encoder. The platen travels a fixed path on a rail which holds the platen a fixed distance from the bed of the encoder, subject only to inherent resiliency of the material from which the encoder is constructed.

In the path of the platen, beyond the position of the credit card plate, are a plurality of wheels, each of which has a series of insignia around the periphery. For example, the wheels often carry the number 0, and 1-9. A plurality of such wheels mounted on a common axis will provide a settable group which may be manipulated to establish any given numerical value in printing position. This is known as the variable data of a transaction, and is used in such instance as the value of a product sold to a customer identified by the credit card plate.

In order to impress the several lines of embossed data usually presented on a credit card, the fixed distance of the platen from the bed must be closely spaced. To assure good impression, sufficient total force must be obtained. The total force is distributed among many insignia data units.

However, upon reaching the variable data wheels, the platen encounters much less foundation to resist the applied load, there being only one single data character on each wheel in the example given. Because the established close path is fixed, the platen will, therefore, overpower the single character. This fact must be considered, even though the wheels are held by a yieldable mounting. Unless the character is constructed of expensive resistant material, it will quickly fatigue to failure. Although the variable data wheels can be made of hardened steel or other metal for destruction resistance, cost factors strongly favor injection molded plastic which does not have favorable impact and crush resistance.

SUMMARY OF THE INVENTION

The advantage provided by this invention is found in the provision for protection of the embossed encoding characters and prevention of character distortion, by the provision of means to limit platen approach toward printing character in the device.

The desired imprint pressure is obtained by relating the

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relative elevation of indicia to the platen surface to space the indicia a distance less than the form thickness for the purpose of causing an imprinting pressure, but not sufficiently close that enough interference is obtained to wedge the form between the platen and the indicia with excessive force causing over-compression and damage to the printing surface of the indicia in addition to heavy printing.

DESCRIPTION OF THE DRAWINGS

10 FIGURE 1 is a perspective view of a data encoding machine embodying the features of this invention.

15 FIGURE 2 is a top plan view to an enlarged scale with respect to FIGURE 1, of the anvil and form retaining guard area of the machine bed.

20 FIGURE 3 is a schematic illustration of the relationship of printing devices positioned upon an anvil, and spacing of a roller platen with respect thereto, representative of the construction seen along line 3—3 of FIGURE 2.

25 FIGURE 4 is a schematic illustration of the relationship of one rotatable variable data wheel, presenting one data character for impression imprinting, and a form mask in position for conjunction action as a spacing means with a form set not yet placed, representative of the construction seen along line 4—4 of FIGURE 2.

30 FIGURE 5 is an enlarged illustration of the FIGURE 4 structure, with a form set included.

DESCRIPTION OF THE PREFERRED EMBODIMENT

35 FIGURE 1 of the drawings illustrates the common type of source data encoder commonly employed in data collection applications and similar environments. The operating mechanism is carried within housing 10. Guide board 12 is provided to assemble the various printing components in working relationship. A recess 13 is formed to accept the top edge of a common form of embossed credit card. An embossed card 15, shown in FIGURE 2, is illustrated in printing position. The recess prevents lateral shifting of the card with respect to guide board 12.

40 As seen in FIGURE 3, an anvil 14, which is spring loaded in this particular type of data encoder, is positioned to underlay a portion of the credit card. The spring loaded anvil gives ample support to cause printing interaction pressure but will yield in the event of overloading. The spring loading is suggested by the arrows in FIGURE 3.

45 The embossed card 15 serves the function of a panel printing plate employed as the transaction related information source. This designation is employed to convey the thought of a thin panel member, with embossed printing characters projecting from one surface. Such panel printing members have been made of metal and composition material as well as plastic material. Although the panel printing members are usually planar, such flatness is not a requirement for the present invention. Hereinafter, reference will be made only to credit card 15, as an illustration of the type of device adaptable to the present invention.

50 In addition to the information provided by the credit card 15, variable data wheels 18 for setting the variable information illustrate a further type of data which compose a part of the usual encoder.

55 The guide board 12 is also equipped with retractable form guides 19 and permanent fixed form guides 20 to enable an interleaved form set to be properly related to the credit card and the various printing members of the guide board. Thus the printing members and the form set are placed in superposed relationship preparatory to rolling a platen over the surface of the combination stack to

impress data from the card through a release carbon of the form set to a sheet which is encoded with the information.

The data encoder of FIGURE 1 employs a head 25 with a cross rail 26. The head pivots to an open position shown in FIGURE 1 for providing access to the guide board 12. The head 25 is closeable to a fixed position resting upon the guide board 12.

A roller platen 30, carried by a yoke 31, rides the rail 26 and has a substantially unyielding path of advancement across the print carrier area of the guide board 12 wherein the variable and fixed indicia is placed.

The head 25 carries a form clamp mask 34. A form clamp mask is optional, but its use has been established in the prior art, Patent 3,277,822, and the spacing concepts of this invention for embossed character preservation is extended to the credit card area by incorporating the shield as a spacer.

Mask 34 is made of thin sheet metal with openings therethrough for framing the printing characters positioned upon the guide board. The mask has a narrow track edge 36 which is related to the guide board 12 in position to traverse the top edge portion of the credit card 15. This position upon the credit card is aligned with the roller platen printing path as the platen moves across the guide board 12, but the area of card 15 upon which it rests is a non-indicia pad area outside of the indicia area which contains the raised characters.

As seen in FIGURE 3, the track edge 36 is resting upon the top surface of the card 15.

The roller platen 30 has an impression surface 37 which is used to cause the impression formation. By positioning one edge of the roller platen to ride on track edge 36, the edge acts as a spacer. If the form set is placed under track edge 36 and on top of card 15, then the form set will cause the card and roller to separate to the extent of the form set thickness. Then the track edge 36 need be only related to the additional separation of platen and credit card to provide good print interference compression, but not allow the platen to rest fully upon the form set.

Each embossed character projects from the card surface essentially a fixed distance. In order to press the character into the form set for best printing quality, the platen must be held a fixed distance from the characters. This space is referred to by those skilled in the art as "interference." If an anvil is unyielding, and the platen is unyielding, the pressure exerted on a character will increase as the form thickness is increased. The yieldable anvil 14 is used to limit the maximum pressure to prevent excessive damage.

The spacer means must be related to the form thickness for proper results. If the form set is placed under track edge 36, then the edge 36 will provide the interference spacing. If the form set is not used under the edge 36, then the choice becomes one of increasing the thickness of edge 36 or supplying other spacing substitutes related to the form set thickness removed. A rim 38 incorporated on the platen edge is an example. The spacer means includes the body of the credit card 15 in the area of its normal thickness outside the embossed character area, and the track edge 36, acting in conjunction with the rim 38. These three make up a spacer means in the FIGURE 3 embodiment. In FIGURE 2, a form set is suggested by the rectangular broken line indicated by reference character 39. It is shown extending just above the data characters, and not under the position of track edge 36.

The amount of the spacing means other than the credit card itself, is arbitrary and desired. The card itself, is arbitrary and designed for the form set or sets for which the device is to be used. In FIGURE 3, raised characters 40 are shown spaced from the surface 37. Regardless of whether the spacing is done entirely by the mask track edge 36 or the combination thereof with other means, the track edge is functionally related to the actual thickness of the form which is to be inserted be-

tween the card 15 and the surface 37. Spacing is assured in order to hold the surface 37 a distance from the characters 40 and thereby prevent excessive pressure whenever a form is placed between the roller and card.

The character on each wheel 18 may likewise be protected by providing for extension of the track edge 36 to the region of the wheels. However, the problems that enter into such an extension are numerous and difficult to overcome. A track under edge 36, to make up the loss of thickness of the credit card 15, could be carried by the machine bed, but then the interference would be fixed, and could not reflect variable form set thickness unless the form set were always used as part of the spacer means.

Therefore, this invention provides for a novel spacing over the variable wheels, the preferred embodiment of which produces other desirable results.

Each wheel 18 must be positioned with the selected indicia brought to alignment with the plane of the card 15 for printing. If the wheel is not rotated into exact level position, a portion of the indicia character will project above the plane of the remainder of the character, and will therefore receive excessive impact. The rolling action of the platen during printing will level the character, but at the expense of excessive deterioration.

According to the preferred form of this invention, each wheel 18 is formed with a pad 41 adjacent each indicia character. The form set to be encoded will consist of paper sheets and interleaved pressure release carbon sheets. Such a form set will resist compaction under flat surface compression, but is subject to further embossing and compression by the limited surface area presented by indicia characters.

The pad 41 is formed to a calculated elevation with respect to the indicia character elevation, such that the form and any other filler sheet placed on the pad will serve as a spacer means to separate and space the platen with respect to the indicia character. In the usual service station situation, for example only, the form is composed of two paper sheets and one carbon sheet.

In the preferred embodiment, as illustrated, the form clamp mask 34 is cut to overlay the series of adjacent pads 41. The form and the mask act jointly as a spacer means, and provide the required interference between the platen and the indicia character. It does not matter how thick the form set may be, this same effective space will persist.

The elevation of the pad 41 must be calculated so that in conjunction with the mask thickness it will provide the proper amount of interference between the platen and the indicia character. The form set thickness may vary but because the same form set overlays both the indicia and the elevated pad, the same interference will be maintained between the platen and indicia character.

It is a further discovery of this invention that the use of the clamp mask 34 over the pads is preferable rather than to increase the pad elevation, because the single sheet mask will urge all the pads to assume an essentially uniform level position. The prior art leveling devices are limited in effectiveness, but a single sheet over all the pads 41 has been discovered to cause all the wheels to come into near perfect alignment.

Also, for aesthetic purposes, the mask reduces the smudge printing in the pad area. Without the mask, each pad 41 prints as distinct bar. With the mask, the printing of the bars 41 is reduced to a far more acceptable level.

What is claimed is:

1. A printing apparatus for printing by pressure release from an ink carrier to a receiving sheet, wherein the pressure is related to the pressure release requirement for full printing in regions of large printing area, and restrained against overwhelming smudge printing pressure in regions of lesser printing area, comprising:

a form set support bed for carrying at least one printing member;

said printing member having an indicia area and an adjacent non-indicia pad area, said areas lying in

side-by-side relationship projecting above said bed; a roller platen, and means for causing said platen to traverse said bed; and a printing pressure control spacer means for establishing and maintaining a minimum interference of said platen with respect to said indicia area, including means spaced laterally from said indicia area and located between said pad area and platen, said means related to the thickness of the form set to be printed for holding the platen separate from the indicia, but with a space less than the thickness of the form set. 2. A printing apparatus as defined in claim 1, further characterized in that: at least one rotatable wheel and one removable panel 15 constitute said embossed printing member; said panel having a planar surface lying on said bed, and one or more indicia characters embossed therein and projecting upwardly towards said roller platen path; 20 said wheel having at least one indicia character on the periphery thereof, said character extending co-planar with the plane of the panel character, a pad area on the wheel adjacent said character; and a sheet member removably positionable over said pad area for clamping a form set in printing position, said pad and sheet member in conjunction with a 25 form set constituting said control spacer means. 3. A printing apparatus for printing by pressure release from an ink carrier to a receiving sheet, wherein the pressure is related to the pressure release requirements for full printing in regions of large printing area, and restrained against overwhelming smudge printing pressure in regions of lesser printing area, the printing being accomplished by a roller platen traversing a panel printing member having printing characters projecting from a restricted print character area of one surface thereof, 30 said apparatus comprising: support means for receiving the printing member and form set in superposed relationship; 40 a roller platen, means for rolling said platen in a printing action path across said printing member; spacer means including a mask of sheet material having openings for framing the printing characters, said mask superposed with the body of the printing member along a portion thereof aligned with said roller path; and said roller platen having a portion positioned to roll on said mask so that said roller will bridge over said 45 openings with a minimum interference of said platen with respect to said printing characters; whereby said printing member body outside the print-

ing character area thereof, and the mask, cooperate together with surfaces of the roller platen to prevent excessive printing pressures in areas lacking printing characters within said printing action path.

5 4. A printing apparatus for printing by pressure release from an ink carrier to a receiving sheet, wherein the pressure is related to the pressure release requirements for full printing in regions of large printing area, and restrained against overwhelming smudge printing pressure in regions of lesser printing area, comprising: support means for receiving a printing member and form set in superposed relationship; a roller platen, means for rolling said platen in a printing action path across said printing member; a plurality of variable data wheels, means to mount said wheels in a group for rotation of the periphery of each wheel with respect to said support means, each said wheel having a plurality of indicia printing characters spaced around the wheel periphery, a flat pad area adjacent each indicia, each said indicia and adjacent pad area defining a separate printing member, said plurality of wheels positionable to align a plurality of printing members into a planar array; a sheet member form mask, said mask having an area to cover said pad areas only of the array, said pad areas having a top surface with a radius distance from the wheel center less than the radius distance to the top of the indicia such that a form to be printed and said mask in superposed relationship to said pad area provides spacer means holding said roller a predetermined distance from said indicia to produce minimum interference; and means to clamp said mask in place over a form, and thereafter guide said roller platen along in a printing path resting upon said mask as a guide.

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