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McGowan et al.

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[54] CARD POSITIONING AND PRINTING UNIT FOR CREDIT CARD READING AND IMPRINTING EQUIPMENT

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[52] **U.S. Cl.** **101/269**, 235/61.11

[51] **Int. Cl.** **B41f 3/20**

[58] **Field of Search** 101/269, 274, 282, 284, 285

[56] **References Cited**

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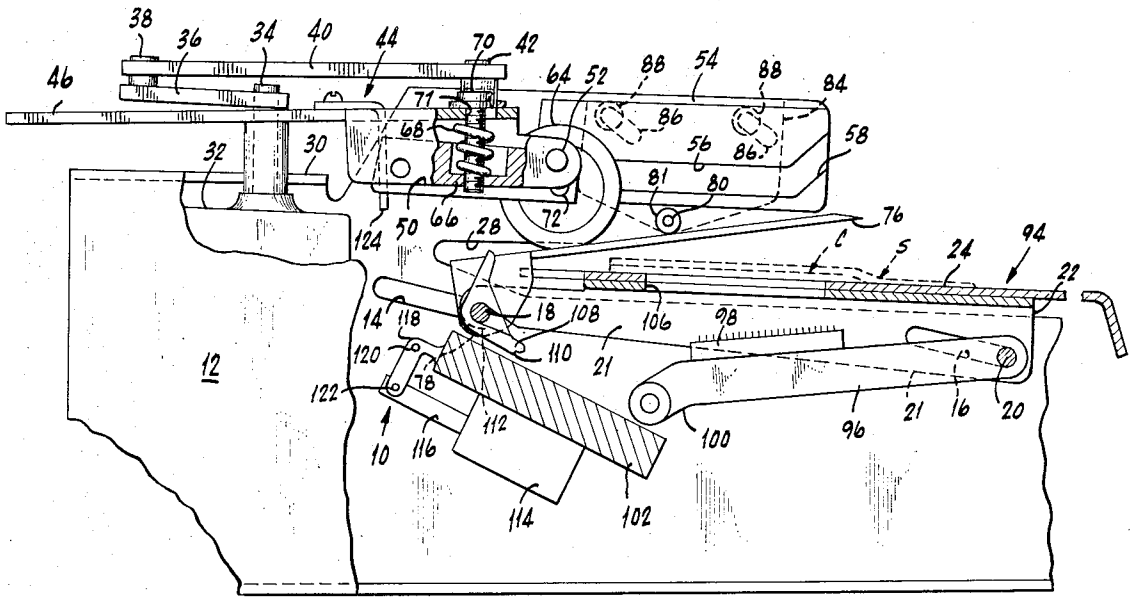
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[57] **ABSTRACT**

A tray supporting a credit card and sales slip, when advanced, causes a hold-down plate to clamp the card and slip in print position. The plate is adjustably presettable to meet customer requirements. An operating mechanism drives a spring-loaded printing roller to imprint the slip, and has a long-stroke capability to increase the print area. The insertion of a card allows imprinting either from the side or end of the slip anywhere along its length and also allows extension of the credit card legend longitudinally of the path of roller travel to improve print quality.

6 Claims, 4 Drawing Figures



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SHEET 1 OF 3

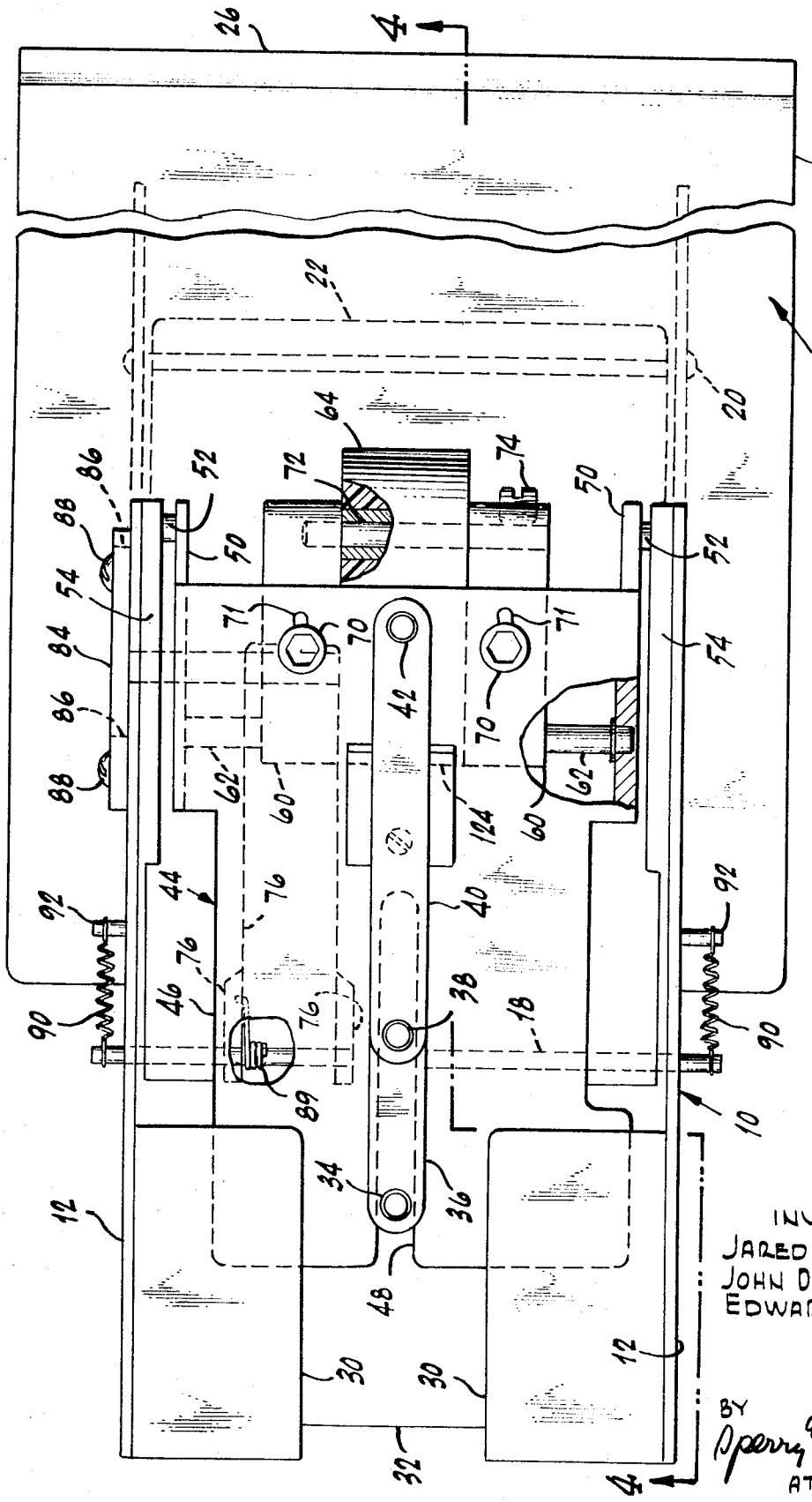


FIG-1.

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FIG. 2.

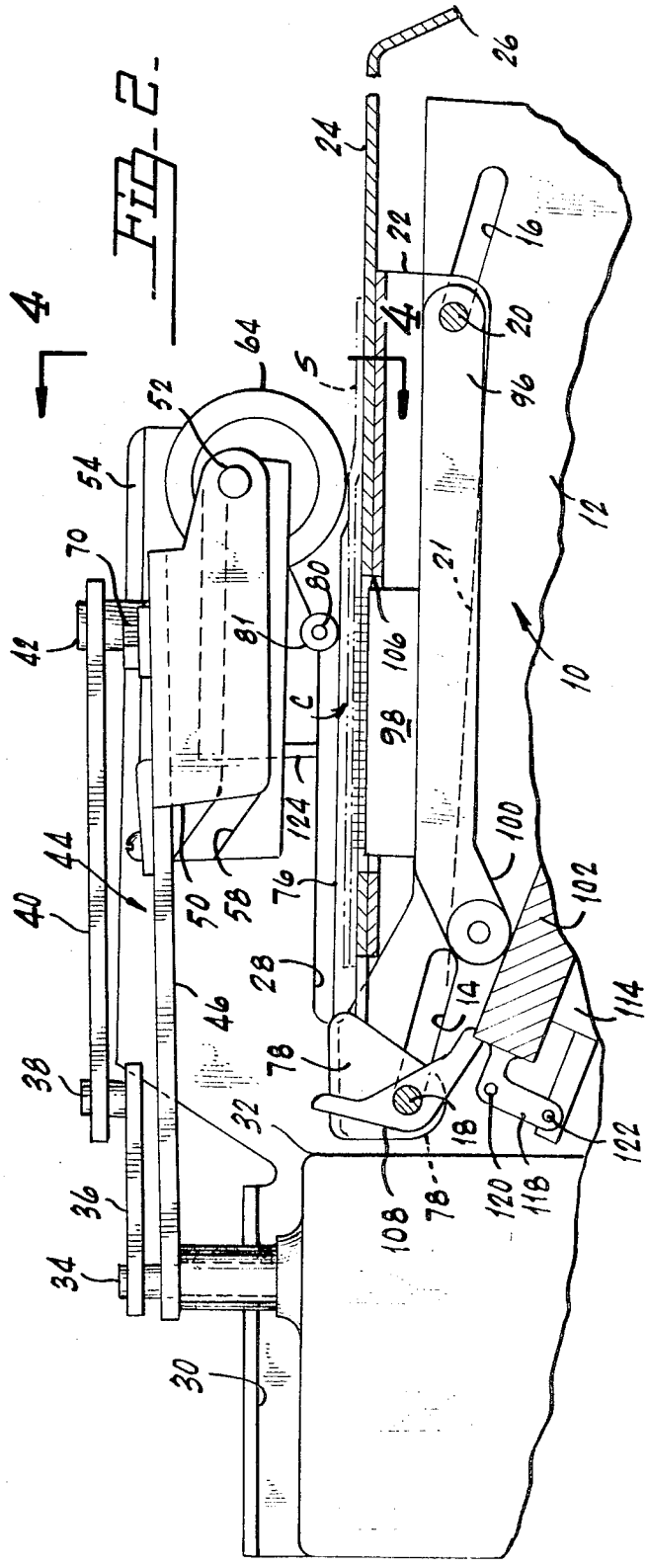
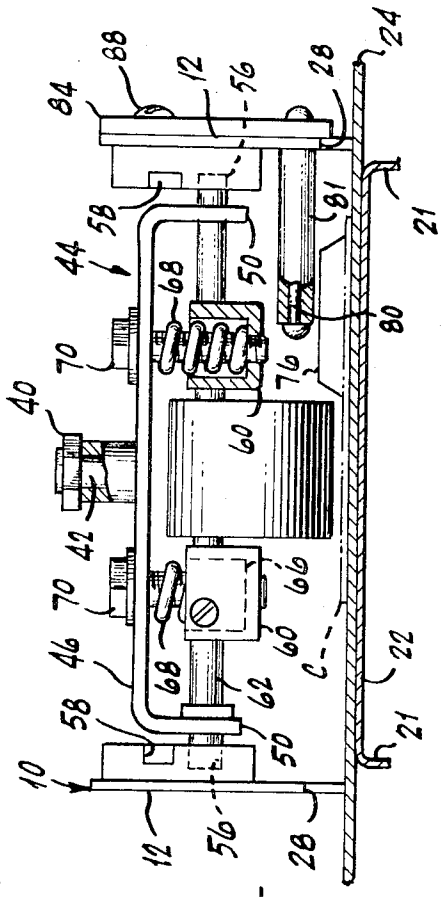


FIG. 4.



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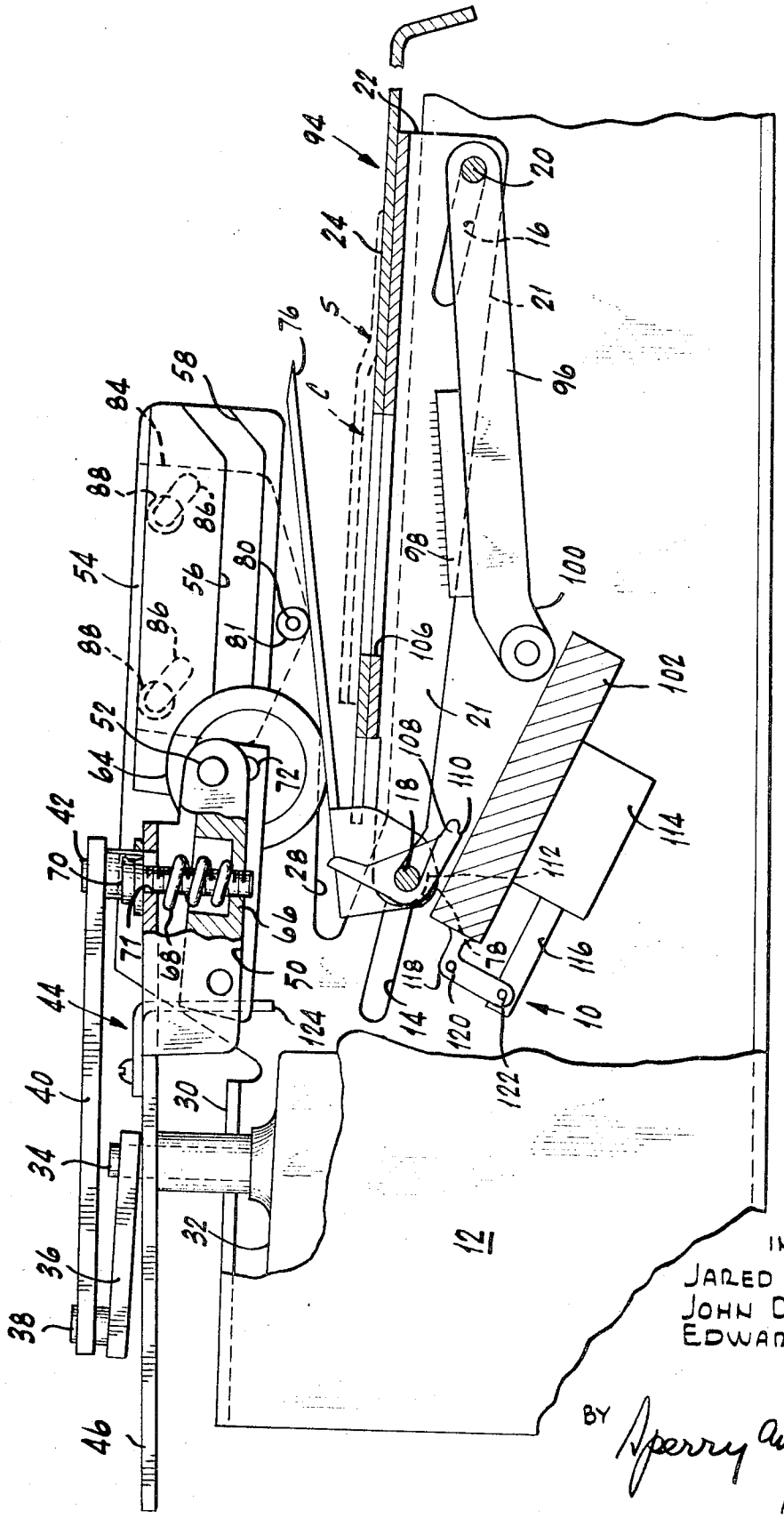


Fig. 3.

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CARD POSITIONING AND PRINTING UNIT FOR CREDIT CARD READING AND IMPRINTING EQUIPMENT

CROSS REFERENCE TO RELATED APPLICATION

The present application is related to application Ser. No. 748,014 filed July 26, 1968 by Thomas Bilinski, Jr., Donald W. Fleischer and Jared M. McGowan.

BACKGROUND OF THE INVENTION

1. Field of the Invention

The invention relates to electrical communications, in particular those incorporating a selective function wherein transmission of a selected impulse to a remote location produces at said location an electrical comparison of said impulse with stored intelligence to effect a return signal which, according to the stored intelligence will be either affirmative or negative.

Although apparatus having the characteristics described above is usable in any of various fields, one in which it can be employed advantageously is consumer credit information. Thus, in a department store, a salesperson is enabled to insert a customer's coded credit card in the apparatus constituting the present invention, together with a sales slip, and receive almost instantaneously intelligence as to whether the customer is or is not permitted to charge the purchase.

In the prior art, further, to our knowledge there have not been provisions for imprinting a sales slip upon an area along the length thereof, except of course by special modification of the apparatus. In this connection, sales slips as used by department stores and other mercantile establishments vary widely in size and format. In some cases, a department store may desire that the imprint of credit card information be placed upon the sales slip in an area extending along one side edge of the slip. In another instance, a department store may desire that the information transferred from the credit card be imprinted at the top of the sales slip. In still other instances, it may be desired that the credit card legend including the card holder's name, address, and account number be placed at the bottom of the slip.

The prior art also, to our knowledge, has failed to give consideration to the necessity of adjusting the hold-down or clamping means, that holds the credit card and sales slip in place for reading of the card and imprinting of the slip. Yet, customer requirements vary widely with respect to the thickness of the material to be imprinted, and this causes a problem with respect to presetting the hold-down means according to the requirements of the department store or other establishment intending to make use of the device.

The prior art, further, has also left unsolved the problem of assuring, at all times, a print of high quality, and in many instances, it is found that the information imprinted upon the sales slip cannot be deciphered due to the fact that the printing pressure was either too light or even too heavy.

SUMMARY OF THE INVENTION

To provide the simplified, compact unit which to my knowledge has heretofore not been produced when the teachings of the prior art are followed, the apparatus constituting the present invention incorporates a tray sliding upon a support frame or chassis within a suitable housing. The tray receives a coded credit card, on which the holder's name, address, and usually his account number, are embossed. A document on which the indication of good credit is to be without imprint (or which is to be left imprinted to show bad credit) is positioned over the credit card, and the tray is shifted inwardly by the user. This operation effects movement of a code-sensing block, which is carried by the tray assembly, into an engagement with the card. According to the code which the block reads upon contact with the card, a signal is automatically transmitted to a remotely located computer or central memory. There is returned, instantaneously to all intents and purposes, to the apparatus constituting the invention, an answering signal, which may be that the credit is good. Alternatively, the answering signal may be that the customer has poor credit.

The apparatus comprising the invention includes a motor-driven roller assembly, mounted above the tray assembly. If the "good credit" signal is received, the motor is energized, and drives the roller through a single printing cycle. The roller is, in this instance, moved over the sales slip, and causes, by pressure upon the embossed characters of the credit card, imprinting of the customer's name, address and account number upon the sales slip. At the same time, the roller assembly unlatches the advanced tray, and ejects the tray with the card and sales slip. If, alternatively, a "bad credit" signal is received, a solenoid is actuated instead of the motor, which unlatches the tray assembly without imprinting of the sales slip. The ejection of the sales slip without imprint informs the salesperson that the customer's credit is not good, and that the charge sale is not approved.

In the present invention, the means for driving the roller is designed to incorporate a long-stroke, so that the roller can traverse an increased length of printing area as compared to prior art devices. The arrangement, further, taken in combination with the insertion of the credit card from the side, allows the legend that is to be imprinted upon the sales slip by transfer from the credit card, to extend longitudinally of the path of roller travel. In this way, the roller contacts each digit or character of said legend separately, in consecutive order, rather than passing over all the characters of each line of information simultaneously as heretofore has been the case. In this way, print quality is improved.

Summarized further, the invention incorporates a roller assembly that is particularly adapted to cause a resilient, uniform roller pressure upon the credit card, accommodating varying thicknesses of material to be traversed by the roller without changing the quality of the print. And, in conjunction with this arrangement, the invention includes an adjustably presettable means for acting upon the hold-down or clamping plate, whereby adjustment in the clamping pressure can be made according to a customer's requirements, before the apparatus is shipped to the customer.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a top plan view of a credit card reader - imprinter, the outer casing being omitted, portions being broken away and other portions being shown in section;

FIG. 2 is a longitudinal sectional view, substantially on line 2–2 of FIG. 1, the card support tray being advanced and latched in its card reading and imprinting position, the roller assembly being in its normal, rest position immediately prior to traversing the area to be imprinted;

FIG. 3 is a view similar to FIG. 2 in which the card support tray has been unlatched and retracted following traverse of the printing area by the roller; and

FIG. 4 is a transverse sectional view substantially on line 4—4 of FIG. 2.

DESCRIPTION OF THE PREFERRED EMBODIMENT

It will be understood that in a commercial embodiment of the invention, the entire apparatus illustrated in the drawing would be housed in a suitable outer casing such as shown, for example, in co-pending application Ser. No. 748,014 filed July 26, 1968. However, since said casing is not essential to disclosure of the present invention, it has been omitted.

Nor, since the present invention is concerned primarily with an improved roller assembly, roller assembly drive mechanism, and card-receiving area, it is believed essential to illustrate circuitry, contact block details used in reading the code of the credit card, etc. All of these have been illustrated and described in complete detail in the mentioned co-pending application.

For the purposes of the present invention, it is sufficient to note that as in the co-pending application, the device includes a support frame that would be housed within the outer casing, said support frame being generally designated 10 and including a base 11 and side plates 12 of opposite but identical formation.

Formed in the side plates are transversely aligned, longitudinally extending, inclined guide slots 14,16, and engaged slidably in said slots are the ends of transversely extending tray support bars 18,20. These extend through openings formed in depending side flanges 21 of a horizontally disposed tray support plate 22, welded or otherwise fixedly secured to the under side of a wide, elongated, flat card support tray 24 of substantially greater width than frame 10 (see FIG. 1) and projecting at one end beyond frame 10. The projecting end of tray 24 is formed with a depending lip 26 providing a handle.

To accommodate the laterally projecting side portions of tray 24, and also to provide side openings through either of which a credit card C can be inserted, side plates 12 are formed with elongated longitudinal recesses 28 opening at one end upon the front end of the frame (the right hand end as seen in the various figures of the drawing).

At the other end of the frame or chassis, side plates 12 have integral, inwardly turned flanges 30 overlying a gear reduction motor 32 having a vertically upper projecting shaft 34 the end of which extends above flanges 30 and is connected to a crank arm 36. Arm 36 is rotatable with shaft 34, and at its outer end is pivotally connected at 38 to one end of an elongated link 40 the other end of which has a pivotal connection 42 to a roller assembly generally designated 44.

Roller assembly 44 includes a generally horizontal top plate 46 the rear end of which (see FIG. 1) is formed with a longitudinally, centrally extending guide slot 48 receiving motor shaft 34. Depending side flanges 50 formed on the front end portion of plate 46 have laterally outwardly extending guide lugs 52 at their front ends, slidably engaging in guide plates 54 mounted upon the inner side surfaces of side plates 12. Plates 54 may advantageously be molded of a low-friction plastic material, and have guide slots 56 in which the lugs 52 slide, and which have upturned ends 58.

Roller assembly 44 also includes a pair of roller support arms 60 pivotally supported at their rear ends by pivot pins 62 that extend laterally inwardly from flanges 50. Between the front ends of arms 60 a printing roller 64 is rotatably mounted.

Referring to FIG. 4, formed in the arms 60 are upwardly opening recesses 66 receiving compression coil springs 68 held under compression between top plate 46 and roller support arms 60.

Screws 70 (FIG. 3) extend through slots 71 formed in top plate 46, and after passing through springs 68 threadedly engage in openings formed in arms 60, for adjusting the tension of the springs.

Referring to FIG. 1, a roller shaft 72 extends between the distal ends of arms 60, and is held in place by set screw 74. Rotatable on shaft 72 is the printing roller 64.

A hold-down or clamping arm 76 (see FIGS. 2 and 3) is normally in an inclined or raised position as shown in FIG. 3, and at one end has depending ears 78 apertured to receive bar 18, on which arm 76 is thus pivotally mounted to swing between its FIG. 2 and FIG. 3 positions.

Biasing arm 76 from its FIG. 3 to its FIG. 2 position is a cam pin 80, upon which a rotatable sleeve 81 may be provided. Pin 80 is adjustable in a direction having both a vertical and horizontal component, to provide for fine adjustments in its position in respect to the clamping plate 76, through the provision of inclined adjustment slots 86 (see FIG. 3) formed in plate 84, through which extend screws 88 threadedly engaged in openings provided in the adjacent side plate 12.

Normally biasing the clamping plate upwardly to its FIG. 3 position is a torsion spring 89 (FIG. 1).

Tray 24 is normally in a rest position shown in FIG. 3, also termed a retracted position. When in this position, it is adapted to receive a card C and sales slip S or other accompanying document. These may be inserted either from the side, through slots 28, or from the front of the device. Thereafter, the user pushes the tray forwardly to its advanced position shown in FIG. 2. In this connection, the tray is normally biased yieldably and resiliently to its retracted position by extension springs 90 connected between retaining pins 92 of the support frame, and the projecting end portions of cross bar 18.

Tray 24 and tray support plate 22 comprise a tray assembly generally designated 94. This may appropriately be considered as a component portion of a card support means generally designated 92.

Card support means 92, in this regard, also includes a code sensing means carried by the tray assembly. Referring to FIGS. 2 and 3, a pair of yoke arms 96 are pivoted at one end, upon cross member 20. Carried by and extending transversely between yoke arms 96 is a pin or contact block 98. This is normally supported by yoke arms 96 in a lowered, retracted position shown in FIG. 3. In use of the apparatus, however, it is biased upwardly to a code-sensing position shown in FIG. 2, in response to advancement of the tray assembly from its retracted to its advanced position.

The shifting of the sensing block 98 upwardly to its FIG. 2 position is accomplished through the medium of a downwardly projecting nose 100 on the distal end of each yoke arm 96. Nose 100, in the illustrated, preferred embodiment, is formed as a roller freely turning upon its associated arm 96, and rollably supported upon an upwardly, rearwardly inclined cam plate 102. Plate 102 is affixed to and extends between side plates 12 and constitutes a portion of the support frame. Yoke arms 96 normally tend with their supported block 98 to gravitate to a position effective to maintain the rollable contact of nose 100 with cam plate 102. Accordingly, when the tray assembly is advanced as previously described herein, the inclination of the cam plate 102 causes yoke arms 96 to be pivoted upwardly from their FIG. 3 to their FIG. 2 positions, thus bringing the block 98 into contact with the credit card C supported upon tray 24.

The details of construction of the block 98 have been fully set forth in the hereinbefore mentioned, co-pending application Ser. No. 748,014. Such details, accordingly, need not be repeated herein. It is sufficient to note that the credit card C is provided with apertures according to the particular code of the card, which apertures are located to receive pins 104 of block 98 when the block is in its FIG. 2, sensing position. As shown in FIGS. 2 and 3, the tray assembly has a rectangular opening 106 receiving block 98 in these circumstances.

Thus, some of the pins 104 will be depressed, these being the pins that register with and hence are received in code apertures of the card. Other pins, however, will be depressed, due to the absence of apertures in the card at the location of these other pins. By suitable circuitry, discussed in detail in the co-pending application, the sensed code number is transmitted to a central memory, not shown, for a credit check. Again, as discussed in the co-pending application, the central memory signals the unit, either that the credit of the card holder is good, or alternatively, that the credit is bad.

Also, as shown in the co-pending application, there is provided in the apparatus a latching means adapted to releasably engage the tray 24 in its advanced position. To this end, a latch element or pawl 108, of right-angular shape, has a lower end formed with a latching recess or notch 110. A torsion spring 112 bears at one end against the latch element, and is coiled about the cross bar 18 with its other end engaged against an adjacent projecting portion of the tray support plate 22.

It is mainly important that the spring be so retained as to exert a resilient, yielding pressure upon the latch element tending to bias the same clockwise as viewed in FIG. 3, about the cross bar 58.

By reason of this arrangement, when tray 24 is advanced from its FIG. 3 position with the latch element 108 overlying cam plate 102, the latch element will be biased against the tension of its associated spring in a counter clockwise direction by the cam plate, until the latch element moves to a position in which its notch 110 will receive the upper or rear edge of the cam plate. This is shown in FIG. 2, wherein it is seen that the engagement between latch element 98 and cam plate 102 will retain the tray in its advanced position. At the same time, the

advancement of tray **24** will be effective to cause the cam bar or pin **80** to bias plate **76**, against the tension of its associated spring **89**, to its clamping position shown in FIG. **2**.

Further, with movement of tray **24** to its advanced position, the cam plate **102** will bias the codesensing means constituted by arms **96** and block **98**, upwardly. This causes the pins **104** to sense the code of card C, closing a circuit according to the sensed code that signals the remotely located central memory. Here would be stored the desired intelligence with respect to all accounts. Substantially instantaneously, accordingly, if a particular account number is a "good credit" account, the central memory will command the apparatus to imprint the sales slip S with the customer's name and address. This is done by causing the roller **64** to traverse the credit card, to transfer the imprint of the name and address carried by said card, to the sales slip.

If, on the other hand, the computer or central memory finds that the account is not a good one, the computer commands the apparatus to reflect the existence of said second fact. In the illustrated example, this is done by releasing the tray for retraction by springs **90** with the sales slip devoid of the imprint.

To this end, there is provided a solenoid **114** secured to the underside of cam plate **102**, and having a plunger **116** normally disposed, in the deenergized condition of the solenoid, in an extended position.

An angular trip element **118** is pivoted, intermediate its ends upon a stationary pin **120**, and is pivotally connected at **122** to the plunger **116**.

Assuming that the apparatus has been commanded to reflect the second fact upon the sales slip S, solenoid **114** will be energized instead of motor **32**. This causes the plunger to be retracted, as a result of which the trip element **118** rotates counter clockwise as viewed in FIG. **2**. When this occurs, pawl **108** is engaged by the trip element, and is accordingly cammed in a counter clockwise direction thereby, disengaging from the cam plate **102**. This frees the tray **24** for immediate retraction by springs **90**, and at the same time, block **98** drops downwardly while the clamp plate **76** swings upwardly to release the card and sales slip for extraction from the apparatus.

Conversely, when the apparatus is commanded to indicate the existence of good credit, an appropriate impulse from the computer causes operation of motor **32** rather than solenoid **114**. Motor **32** operates to rotate shaft **34** through a single rotational cycle, causing roller **64** to move to a single back-and-forth stroke, thus to imprint the sales slip.

It will be understood that the embossed characters on the card are directed upwardly, in contact with the upwardly facing sales slip. Accordingly, when the roller exerts pressure upon the face of the sales slip, the characters will be imprinted upon the sales slip by the inked roller, since the only pressure points that will be transmitted to the slip are at the locations of the embossed characters of the card. If the sales slip is in multiple, suitable interleavings of carbon paper, or the equivalent thereof, will correspondingly imprint the duplicates.

When the roller is moved from its normal rest position shown in FIG. **2** across the printing area to its opposite extreme position shown in FIG. **3**, an adjustably positioned finger **124** thereof engages the upwardly projecting end of latch element **108**, biasing the latch element counter clockwise to the release position thereof, so as to free the tray for retraction at the conclusion of the imprinting of the sales slip with the customer's name and address. The upper end of the latch element, in the circumstances, slides under the finger as the tray moves to its retracted position.

An important feature of the invention resides in the roller assembly construction. Normally, the roller assembly is in the FIG. **2** position thereof. In these circumstances, the guide lugs **52** are in the inclined front ends **58** of slots **56**, thus elevating the roller **64**. When the tray is advanced, the tray moves upwardly due to the inclination of slots **14**, **16**, into close proximity to the roller. In FIG. **2**, the tray is shown advanced and latched, with the device awaiting a signal from central memory as to whether the sales slip is to be imprinted, or alternatively discharged without imprint.

Assuming that the credit report is good, and that the sales slip is to be imprinted, shaft **34** is given a single **360°** rotation. As crank **36** turns through its first 180°, the roller moves from its FIG. **2** to its FIG. **3** position. Guide lugs **52** are shifted downwardly, entering the horizontal, elongated intermediate portion of guide slot **56**. In these circumstances, the roller is brought into engagement with the credit card, and springs **68** are compressed, so that the roller is caused to exert a firm, resilient printing pressure against the credit card. As previously noted, suitable adjustments can be made in the spring tension.

When the roller has moved to its FIG. **3** position, the pawl **108** will have been engaged by its finger **124**, and the tray will be released. The rotation of the motor shaft **34** through the remaining 180° of its single rotational cycle will now cause the roller to be moved back to its FIG. **1** position, awaiting the next use of the apparatus. As it moves back, it will be out of contact with the Card C and sales slip S, which are now manually removed.

Another important feature of the invention resides in the ability to make fine adjustments in the clamping pressure exerted by plate **76**. This is accomplished through the provision of the adjustable plate **84**. Department store sales records vary with respect to the type of sales slip used, and the thickness of the multiple leaves employed. Therefore, it is necessary that there be a pre-setting of the plate **76** before the device is used. This is accomplished at the factory before shipment of the equipment to the department store or other establishment intending to make use of the apparatus.

Still another important feature of the invention is found in the fact that the card and sales slip can be fed into the device either longitudinally thereof, or from either side. This is important by reason of the fact that it permits the credit card to be located whereever desired upon the length of the sales slip. Again, this adapts the device, without modification, to use in any of a wide variety of situations involving sales slips of different formats.

Another important feature of the invention is found in the fact that the imprint on the sales slip is improved, due to the fact that the card is turned 90° to the direction of roller travel. The roller, in other words, adjusts pressure against each character in the customer's name, address, and account number, in consecutive order, rather than engaging all the characters of a single line at one and the same time.

We claim:

1. A mechanism for imprinting a sales slip or the like with credit card information, comprising:

a. a support frame;

b. card support means mounted thereon for movement between a normally retracted and an advanced position, and having an area adapted to support a credit card and an accompanying sales slip in superposed relation;

c. a roller assembly mounted for reciprocating motion back and forth over said area and including a roller exerting pressure, during each reciprocation of the assembly, against the superposed card and slip to imprint the slip with the credit card information;

d. means for imparting reciprocating motion to said assembly; and

e. means extending in laterally spaced relation to the roller disposed as a hold-down for the superposed card and sales slip during the imprinting of the slip, the hold-down means comprising an arm pivotally connected to the card support means for movement between a raised release position and a lowered clamping position, said mechanism including cam means on the frame located in the path of said arm to bias the same to its clamping position when the card support means is shifted to its advanced position.

2. A mechanism as in claim 1 wherein the cam means includes a plate mounted for adjustment upon the frame obliquely to said path, and a cam pin projecting laterally from said plate across said path.

3. A mechanism for imprinting a sales slip or the like with a credit card information, comprising:

a. a support frame;

b. card support means mounted thereon for movement between a normally retracted and an advanced position, and having an area adapted to support a credit card and an accompanying sales slip in superposed relation;

c. a roller assembly mounted for reciprocating motion back and forth over said area and including a roller exerting pressure, during each reciprocation of the assembly, against the superposed card and slip to imprint the slip with the credit card information;

d. means for imparting reciprocating motion to said assembly; and

e. means carried by the card support means extending in laterally spaced relation to the roller and disposed as a hold-down for the superposed card and sales slip during the imprinting of the slip, said hold-down means being disposed in a raised release position in the normally retracted position of the card support means, the hold-down means when in its release position and the card support means when in its retracted position opening upon both sides and to the front of the mechanism for selective insertion and removal of the card and slip from either side or from the front of the mechanism, said hold-down means shifting to a lowered, card-and-slip-clamping position in response to shifting of the card support means to its advanced position, the roller assembly further including a roller support plate and laterally projecting guide lugs thereon slidably supported upon the frame for movement in a path between opposite extreme positions in both of which the roller is retracted clear of the paths in which the card and slip are insertable into and removable from the open sides and front of the mechanism, said path of the guide lugs being wholly straight during the portion thereof in which the roller imprints said slip with the credit card information, said path of the guide lugs having end portions extending obliquely to the straight portion thereof to shift the roller to its retracted position as it approaches the respective, opposite extreme positions of the guide lugs, said roller assembly additionally including at least one roller support arm pivotally connected to the roller support plate, said roller being rotatably mounted upon the roller support arm.

4. A mechanism as in claim 3 wherein the roller assembly further includes a spring between said arm and plate tensioned to resiliently, yieldably bias the roller into firm contact with the superposed sales slip and credit card.

5. A mechanism as in claim 4 wherein the frame includes guide slots for said lugs turned upwardly at their ends to elevate the roller assembly out of contact with the surface to be imprinted at both ends of its path of travel.

6. A mechanism for imprinting a sales slip or the like with credit card information, comprising:

a. a support frame;

b. card support means mounted thereon for movement between a normally retracted and an advanced position, and having an area adapted to support a credit card and an accompanying sales slip in superposed relation;

c. a roller assembly mounted for reciprocating motion back and forth over said area and including a roller exerting pressure, during each reciprocation of the assembly, against the superposed card and slip to imprint the slip with the credit card information;

d. means for imparting reciprocating motion to said assembly; and

e. means extending in laterally spaced relation to the roller disposed as a hold-down for the superposed card and sales slip during the imprinting of the slip, said roller assembly including a roller support plate and laterally projecting guide lugs thereon slidably supported upon the frame, said plate having a longitudinally extending slot, said means for imparting reciprocating motion to the roller assembly including a motor, a shaft thereon, and an articulated linkage between the plate and shaft translating rotary motion of the shaft into linear motion of the plate, said shaft extending through the guide slot of the plate to guide the plate during its reciprocating sliding movement on the frame.

* * * * *