

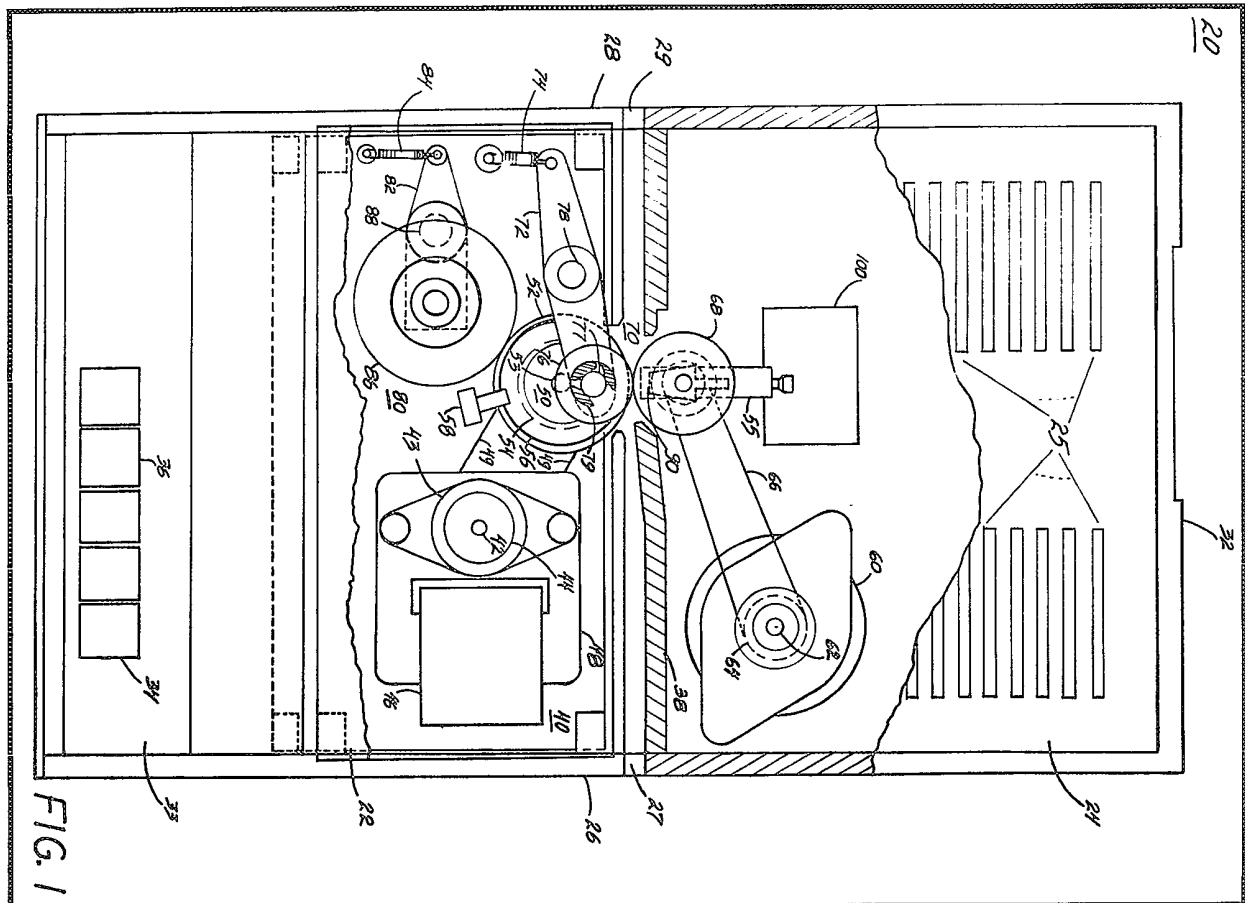
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(54) Printer

(57) In a printing device for printing information at a predetermined location on a document a single (optical) sensor 90 performs a plurality of functions, including: detection of the presence of a document at the print station 50, thus enabling the print operation to begin; detection of the leading edge of the document and provision of a signal to enable operation thereby providing for positioning of the printing in a predetermined field on the docu-

ment, detection of indicia on the document in order to position printing on a document at predetermined fields with respect to such indicia, and detecting of trailing edge of the document, to discontinue the printing operation. The alignment of the sensor 90 with a print station 50 and document conveying means (wheel 68) permits printing on documents of different lengths, thicknesses, or widths at precisely determined positions, and minimizes the requirement of using solenoids in the printer.



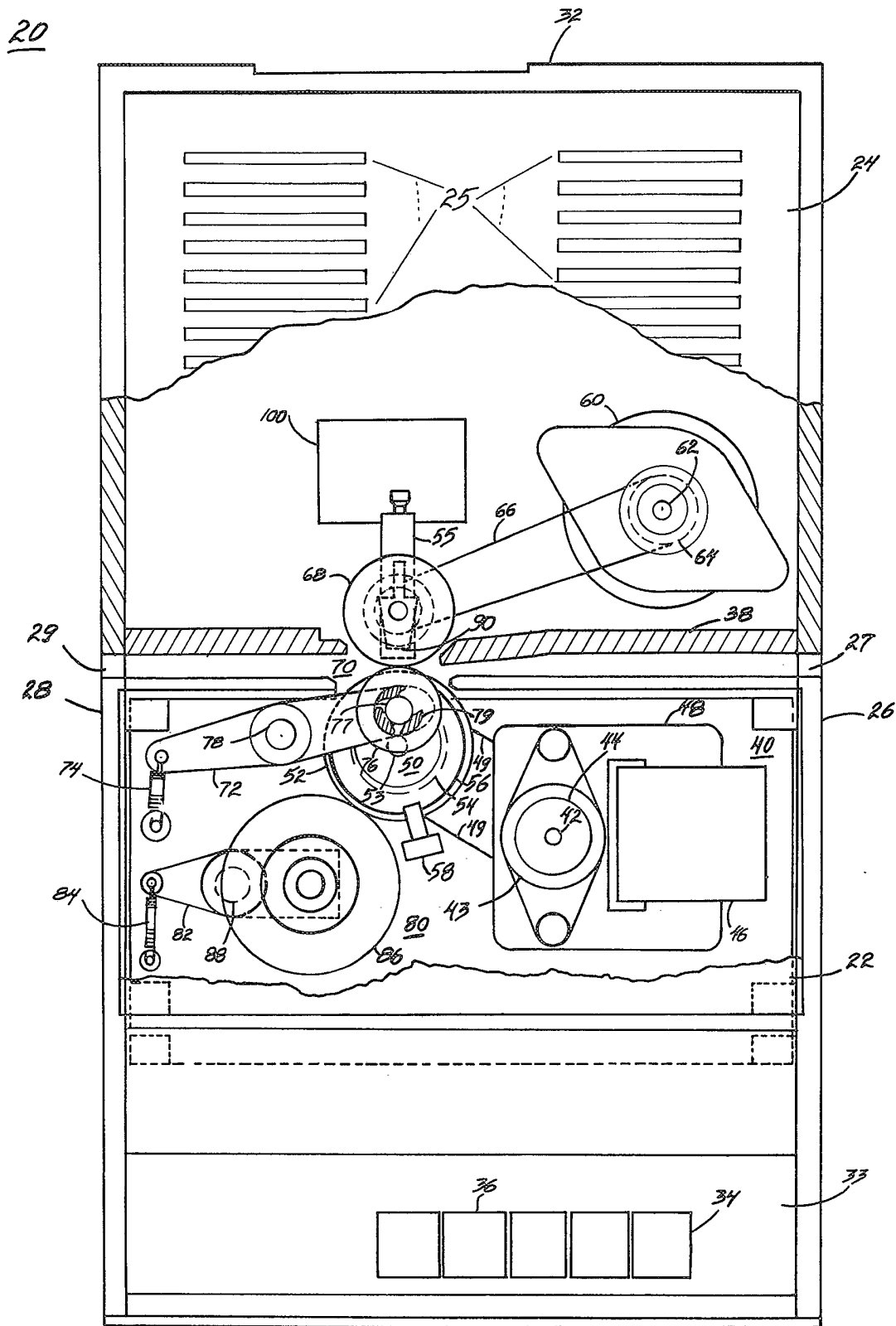


FIG. 1

2026392

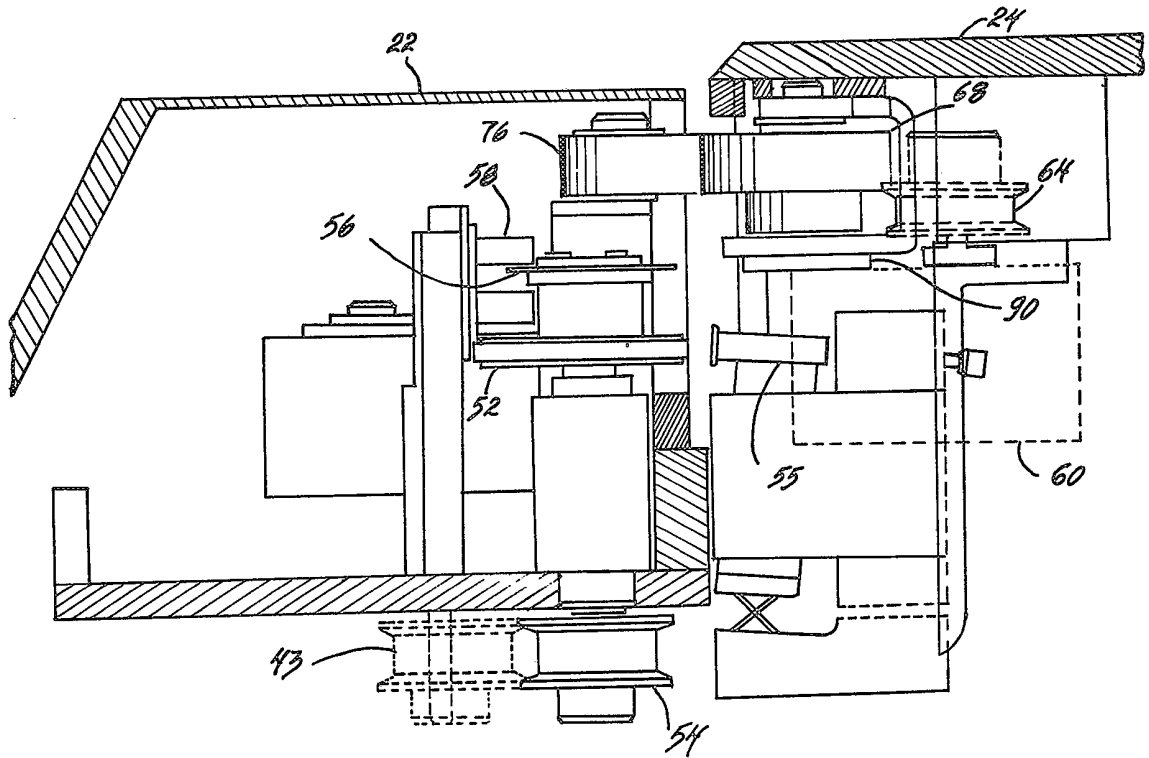


FIG. 2

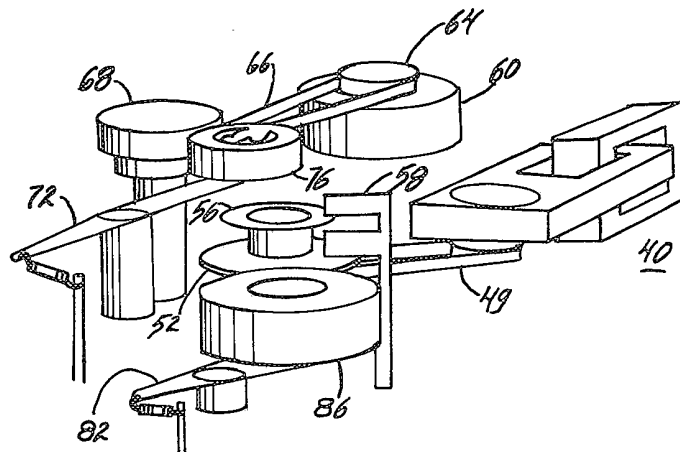


FIG. 3

2026392

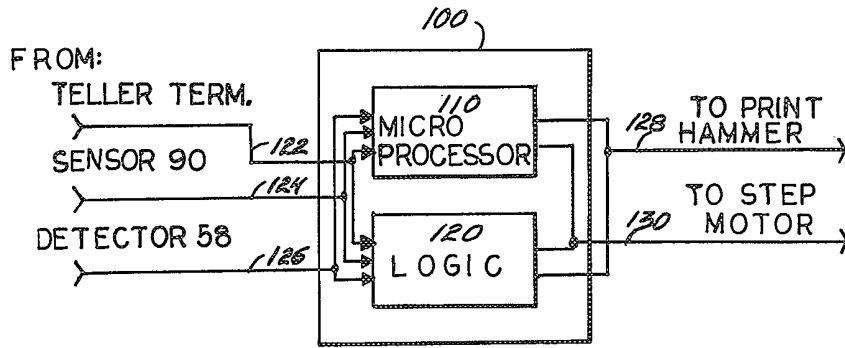


FIG 4a

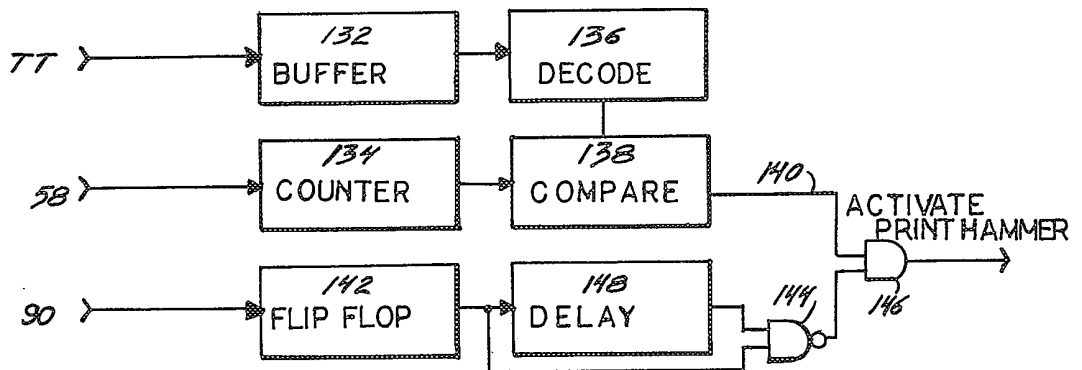


FIG 4b

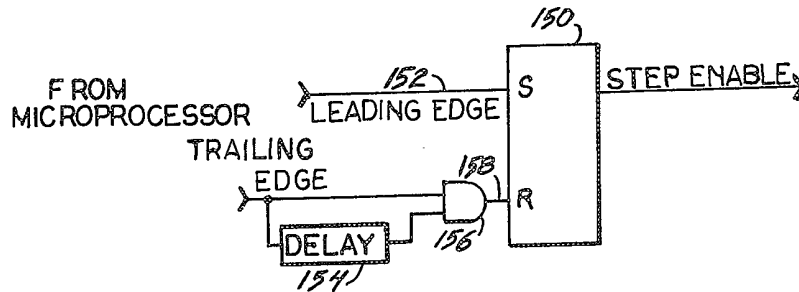


FIG 4c

## SPECIFICATION

### Single line validation printer

#### 5 TECHNICAL FIELD

The invention generally relates to printing devices for documents validating transactions, and more particularly to devices for printing a single line of information at a predetermined location on a document.

#### BACKGROUND OF THE PRIOR ART

Devices for printing information at predetermined locations on an inserted document, such as a card, are known. Bukowski et al, U. S. Patent 3,718,244 illustrates such a device. An apparatus is provided therein where a card, after being manually marked by sales personnel, is inserted into a printer in a first direction, and lines of print are provided on the document transverse to the direction of insertion thereof. Each such line of print is provided at a predetermined location, as determined by counting a plurality of preprinted indicia on the document. The apparatus includes a sensing switch, having a plate for determining the insertion of the card. A separate scan head is utilized to detect card position from the preprinted indicia thereon, thus providing control over a printing drum. Additionally, transport means is provided for the card, including a drive wheel on a pivotally secured support arm, cooperating with a pressure roller supported in turn by a spring biased arm. However, a blocking pin and other means are needed to release the pressure roller in order to press on the inserted document. The printing drum, driven by a stepping motor, is associated with a pair of rotating arms and a magnetic pickup, the latter being utilized to detect the position of the drum.

Similar to other devices of the prior art, the patented device requires the utilization of a plurality of sensors, particularly, a switch sensor for determining the insertion of the document, and a second sensor for determining the location of a plurality of indicia on the card in order to determine placement of the printed field thereon. The requirement for the utilization of a plurality of sensors adds unnecessary expense to the fabrication of such devices. Additionally, the imprinting of many precisely aligned indicia on a card adds expense to the production of such cards, and requires additional precision in their manufacture. Moreover, the requirement for stopping means operating on a pressure roller complicates the drive means for the document being inserted into the apparatus. Utilization of a stepping motor in conjunction with a braking step for the printing operation adds further complications to the printing process.

Line finding devices are known for use in printing on documents having a plurality of

lines printed thereon. These devices generally include a requirement for line position indication on the document itself, not unlike the teaching of U.S. 3,718,244. A device requiring such indication is disclosed in Madge, at al U.S. Patent 3,553,649, where control information is provided on a magnetic stripe, and line finding information is similarly provided. The document accordingly needs to be advanced beyond the appropriate line in order to obtain complete control information, and is then returned to the appropriate empty line for imprint. The device further includes a line sync means, including a disc and photosensing device associated therewith.

Other prior art devices include Zambolin et al, U.S. Patent 3,991,875, providing an accounting device for driving, stopping, and line spacing of a form therein. However, a micro-switch feeler is utilized, a second switch is needed to sense the edge of the card ahead of the driving roller, and yet a third sensor is provided for the card upon leaving the hopper, typical of the use of multiple detectors found in the prior art.

Jarmy, U.S. Patent 3,595,566, utilizes a plurality of photodiodes to start a motor and to provide further operation control thereover.

Other line finding techniques are known to require indications along the document, as in U.S. Patent 3,553,649, discussed previously. Templeton, U.S. Patent 3,211,270, utilizes perforations, for example, and Ghertman, U.S. Patent 2,181,992 requires a stripe at the side of the document. Similarly, Zaccagnino, U.S. Patent 3,942,622, provides for the utilization of a plurality of optical emitting and detecting devices.

#### 105 BRIEF SUMMARY OF THE INVENTION

Accordingly, it is a primary object of the present invention to overcome the deficiencies of the prior art and provide an improved, simplified document printing apparatus utilizing a minimal number of detectors, and further minimizing the number of solenoids, which add bulk and expense to such printing apparatus.

It is thus an object of the present invention to provide a printing apparatus for a document, with a specifically positioned field of print, utilizing a single sensor for the document.

It is a further object of the invention to provide a printing apparatus for variably placed fields of print on a document which does not require the document to be pre-printed or preprovided with registration indicia thereon.

Yet another object of the invention is to provide a printing apparatus for documents which does not require the provision of solenoids therein in order to grip the document.

An additional object of the invention is to provide a printing apparatus for insertable

documents having differing widths, without the necessity of providing complex control equipment therefor.

5 Still another object of the invention is the provision of a simplified printing apparatus for documents wherein a single detector of the document is utilized to initiate the performance of several functions, including detection of the document, initiation of a pro-  
10 grammed printing operation, initiation of a counting process to determine the appropriate position for printing to occur, and for initiating a counting operation from a displaced index located on the document.

15 It is a further object of the invention to provide a printing apparatus capable of printing at variable locations on documents of varying dimensions.

20 Another object is the provision of a printing apparatus for documents inserted therein having a capability of printing at locations immediately adjacent the leading edge of the document.

25 In accordance with the preceding objects, a single line validation printer is herein disclosed. The printer is utilized for printing one line of information on a document inserted therein, to be retained by a customer as a validation of a transaction conducted at a  
30 business establishment, such as a financial transaction at a bank or credit transaction at a particular merchant-operated establishment.

The disclosed apparatus includes a single sensor, specifically a photodetector, aligned with the printing station therein. The printing station includes a print wheel and a hammer, and further includes the drive means for conveying the document within the printing apparatus. The drive means is similarly aligned  
40 with the printing wheel, thus enabling a single sensor to perform a plurality of functions. The alignment of the photodetector with the printing position permits detection of and counting from the leading edge of the document to be precise with respect to the printing position.  
45 Further, by providing a manually operable switch to begin operation of a motor for the print wheel, the present invention permits a document to be faced with an already operating print station within the printer. Accordingly, the photodetector is utilized to detect the presence of the document to enable the print operation as well as to detect the leading edge of the document or an index thereon.

50 The sensor may be precisely aligned with the print position, and need not be in advance thereof in order to provide sufficient time for the print wheel motor to be energized and to come to proper operating speed. The present invention, by using a step-motor driven drive wheel in combination with an idler wheel, further permits documents of different widths to be printed upon without the necessity for adjustments therefor. That is, a spring-loaded  
65 idler wheel is positioned to cooperate with the

drive wheel in conveying the document past the printing station. The leading edge of the document is drawn into the nip formed between the drive wheel and the idler wheel  
70 (displaced under spring bias to accommodate the document) regardless of its width. The disclosed printing apparatus is under the control of a preprogrammed microprocessor and includes manual controls for startup and terminal identification, test functions and for  
75 reset in the event of errors. Additionally, indicators are provided for terminal identification, instructions to the operator, and error indication. The microprocessor is essentially responsive to the signals generated by the single  
80 photodetector, as well as to signals generated by a second detector tracking the position of the print wheel. The rotating print wheel presents the proper character at the print station  
85 and provides a signal to the control which then causes the activation of a print hammer, thus imprinting the desired character at a particular location on the card. By providing a pass-through printer, having separate insertion and ejection slots and including a controller  
90 having a counting facility, it becomes possible to place a field of print anywhere along the longitudinal dimension of the document. The structure further enables printing on documents of any length as they pass by the print station while passing through the printer. Further, by utilizing an open slot for document passage, printing on documents of any width is enabled.

100 These and other objects, features, and advantages of the present invention will become more readily apparent from the following specification and appended claims, when considered in conjunction with the attached drawing.  
105

#### *BRIEF DESCRIPTION OF THE DRAWING*

*Figure 1* is a plan view of the printing apparatus.

110 *Figure 2* is a cross-sectional view of the apparatus taken along cross section 2-2 of Fig. 1.

*Figure 3* is a perspective view of some of the significant features of the present printing apparatus.

115 *Figures 4a-c* illustrate logic control for the printing apparatus.

#### *DETAILED DESCRIPTION OF THE INVENTION*

120 In accordance with the preferred embodiment of the present invention, the printing apparatus is generally indicated at 10 in the accompanying figures. A housing assembly, shown at 20, includes a sectioned cover plate, comprising front piece 22 and back section 24. Section 24 includes therein ventilating slots 25. Housing 20 further includes sidewalls, including a first sidewall 26 for insertion of the document, and a second sidewall  
130

28 for ejection of the document therefrom. Sidewalls 26 and 28 include therein slots 27 and 29, respectively, for the document to be inserted into and ejected from the printer. Use of a sectioned cover plate permits insertion of any width document into the printer, since only one edge 27a is provided in slots 27 and 29 and the documents accordingly may project to any distance above the slots.

In addition to the above-mentioned cover plate and sidewalls, a back cover 32 is provided for the housing. A front section 33 includes thereon keyboard 34 comprising a plurality of buttons for manual activation. These buttons, illustrated by key 36, are utilized to provide manual control over the printing apparatus and to provide condition displays.

Within housing 20, the slot 27 is at the beginning portion of a guide path for the document through the inventive device. Towards that end, a slot guide plate 38 is provided for guiding the documents to the printing station shown generally at the print wheel assembly 50.

An AC motor assembly 40 is provided for driving the print wheel assembly 50. The motor includes an output shaft 42 providing the output torque. Shaft 42 has mounted thereon a pulley 43, and rotates within bearing 44. The motor is illustrated in the present embodiment as having a transformer winding 46 and a laminated core 48 therein.

Belt 49, driven by pulley 43, transmits the output power from motor 40 to wheel assembly 50.

The print station includes therein, as part of assembly 50, a print wheel 52 mounted upon shaft 53. Shaft 53 has affixed thereon pulley 54 drivingly engaged by belt 49 and causing wheel 52 to rotate responsive to activation of motor assembly 40 and rotation of output shaft 42. A print hammer 55 is disposed across from print wheel 52, separated by the document path at the printing station. Selective activation of hammer 55 causes the document to impact against the print wheel, at a point in time when a specific character thereof is located opposite the hammer. The location of the individual characters on the print wheel is ascertained by track disc 56 in cooperation with detector 58.

The presently preferred embodiment utilizes a disc 56 having several slots thereon, and a photodetector to sense the individual slots. It is appreciated, however, that other types of shaft encoding and detecting means may be used, such as magnetically actuated detectors responsive to magnetically encoded data, electrostatic sensors cooperating with electrostatically stored data, or microswitches responsive to individual perforations or protrusions in the tracking device.

The document inserted into slot 27 and guided by plate 38 is engaged by a conveying

mechanism past the printing station comprised of print wheel 52 and hammer 55. The conveying means is driven by a stepping motor shown at 60 and having an output shaft 62 having a pulley 64 affixed thereto. Pulley 64 drivingly engages belt 66, which in turn drives the drive wheel 68. Inasmuch as the document is inserted at slot 27 and passes through the printer, emerging at ejection slot 29, use of a conveying means continuously operable in one direction enables documents of any length to be inserted into and printed upon by the printer.

Drive wheel 68, in conjunction with idler assembly 70, engages the document by forming a nip for receiving and frictionally advancing the document at the print station. Specifically, idler assembly 70 comprises a linkage 72 pivotably disposed between spring 74 and idler wheel 76. Linkage 72 pivots about pivot point 78 to permit idler wheel 76 to be displaced from drive wheel 68 by a document. Spring 74 biases idler wheel 76 against drive wheel 68, but is biased sufficiently lightly in order to permit a document of a predetermined thickness to displace the same from the drive wheel. Idler wheel 76 is disposed upon a central pin 77 projecting from linkage 72, and is retained thereon by a retaining means such as a snap ring 79. The operation of the drive mechanism begins prior to the approach of the document, that is, the drive and idler wheels are in rotation when the document approaches the nip formed therebetween. No solenoids are required either to maintain the idler roller displaced from the drive wheel or to bring it in to engagement with the document in combination with the drive roller.

An advantage of the present invention is in the placement of the document detector substantially at the longitudinal location of both the nip of the drive mechanism and the print station. In prior art devices a sensor would, of necessity, be placed in advance of the drive mechanism and in the document path. This is required in order to activate the print wheel prior to its engagement of the document. Accordingly, if a single detector were to be used in the prior art devices, the detector would of necessity be placed in the document path in advance of the printing station. Accordingly, precise alignment of the printing point with the document edge would be lost in view of the uncertainty of the actual location of the document edge. The prior art devices accordingly utilize a second detector for operation of the printing mechanism at the print station. The present apparatus, by providing for manual activation of the step motor and the document conveying means, as well as of the printing motor, assures that by the time the document arrives at the printing station and the drive wheel, it may be drawn in by the drive and idler wheels which do not require

any additional start up time. It is thus sufficient to provide but a single detector, located at precisely the printing station, to permit accurate placement of the printed information

5 within a predetermined field on the document.

Print wheel 52 is in frictional engagement with a reinking assembly 80. The reinking assembly comprises a linkage 82 connecting a spring 84 to inking wheel 86, the latter

10 providing the reinking of print wheel 52.

Linkage 82 pivots about pivot point 88.

Operation of the entire system is enabled by the proper placement of optical sensor 90, directly opposite the print station, and disposed vertically intermediate the drive station and the printing station. For the reasons previously outlined, the placement of the single detector is advantageous in the present embodiment in permitting the elimination of

20 other detectors as required by the prior art, as well as the elimination of solenoids otherwise required.

In operation, an operator depresses a key 36 on keyboard 34 disposed in front section 33 of housing 20. Activation of key 36 initiates the motor assembly 40 driving the printing station. Additionally, depression of key 36 further prepares stepping motor 60 for activating the document conveying station. After

30 depressing key 36 the operator inserts the document to be printed in slot 27. The document is guided by slot guide plate 38 into the printing station and into driving contact between drive wheel 68 and idler 76. The

35 document is then conveyed by the drive wheel past the print station, where it is imprinted with the predetermined information therefor. The driving mechanism continues to advance the document even after the completion of the printing operation, causing the leading edge of the document to exit via

ejection slot 29.

Sensor 90, a photodetector, activates the printing mechanism by detection of the leading edge of the document. Detection of the leading edge permits precise print positioning relative thereto. Additionally, the detector senses the presence of a document at the print station, providing a signal enabling the

50 printing to occur. Printing is disabled when a document is not detected at the print wheel-print hammer intersection, in order to protect the printing station. Upon detection of the leading edge, a predetermined number of

55 steps may be counted for advancement of the document prior to initiation of printing. This predetermined number of steps accordingly fixes the print field anywhere on the documents, which may be of any length. Such

60 placement of the field with respect to specific documents may be fixed or controllable, or may be programmable, or in the alternative, may be controlled by activation of yet additional keys on keyboard 34. Field placement

65 may also be effected by printing a number of

blank characters beginning at the leading edge. Another feature enabled by the present structure is placement of a single index on the document in order to initiate the printing

70 process. That is, the step counting or blank printing procedure may be initiated by detection of a preplaced index on the document.

The printing field is thus caused to be placed a predetermined number of steps away from the index, rather than from the leading edge of the document. Similarly, a trailing index may be placed on the document to indicate termination of all such activities. Thus, unlike prior art devices, a single index may be used

75 in the present apparatus to provide for variable displacement of the printing field from the document edge.

Control of the inventive apparatus is obtained by utilization of a controlling means 100, which essentially comprises a microprocessor 110 and other logic devices 120. The microprocessor is programmed to perform the various functions hereinabove described in a manner known to those skilled in the art. In operation, the microprocessor provides a step control signal to the step motor upon detection of the leading edge. A print signal is provided to print hammer 55 upon receipt by the microprocessor of a signal from detector

85 58 indicative of the presence of the proper character on the print wheel at the print station.

As shown in Figs. 4a-c, controller 100 receives input signals on line 122 from a teller terminal or other apparatus containing therein information to be printed. Line 124 carries signals from photodetector 90, and line 126 inputs signals from sensor 58. Output signals are provided on lines 128 and

100 130 to the print hammer and step motor, respectively. The output signals may be generated by programming of microprocessor 110 or by utilization of hardware, as shown in Figs. 4b and 4c, for example.

In order to activate print hammer 55, it is desired that the character to be printed be at the printing station and that a document be in position for printing. Additionally, it is desired to provide a capability for the device to im-

115 print on perforated cards, and not to be disabled by the presence of a perforation opposite photodetector 90, which might lead the microprocessor to conclude that the trailing edge of the document had been reached and that no document is in the print station.

The information to be printed, whether received from a teller terminal or elsewhere, is stored in a buffer 132. The printwheel character presently at the printing station is determined by the output of the sensor 58, and is stored as a count in counter 134. In the presently preferred embodiment, disc 56 comprises a slot corresponding to each character on the print wheel, and a further slot located

130 between the last and the first characters of the



wheel. Thus, upon detection by detector 58 of the further slot, a reference point is established and the individual slots provide a count and thus an indication of the specific wheel character at the printing station. The detected pulses are utilized to cause counter 134 to increment. The character to be next imprinted is output from buffer 132 and decoded in decoder 136 to provide a number for comparison with the number stored in counter 134, the comparison occurring in comparator 138. It is understood that the output of counter 134 may alternatively be encoded and compared with the output of buffer 132. Comparator 138 outputs a signal on line 140 to activate print hammer 55 upon a positive comparison between the outputs of decoder 136 and counter 134. However, to facilitate the further advantageous feature of the present invention wherein perforated cards may be imprinted, additional circuitry is provided as shown at the bottom of Fig. 4b. Specifically, the input from sensor 90 may be used to toggle a flip-flop 142 and provide an output indicative of the presence or absence of a card opposite sensor 90. Taking the output of flip-flop 142 to indicate the absence of a document at the printing station, this output may be NANDed with a delayed value for that signal in NAND gate 144 to provide an enabling signal to gate 146 thus permitting the output of comparator 138 to pass therethrough and provide a signal for activating the print hammer. Delay means 148 receiving the output of flip-flop 142 may be a flip-flop or other means known in the art.

Similarly, the signals from sensor 90 may be differentiated or otherwise processed by microprocessor 110 to provide signals indicative of the leading and trailing edges of the document. As shown in Fig. 4c, the leading and trailing edge signals may be used to control a flip-flop 150 to output a signal enabling the activation of the step motor. Thus, when a leading edge has been detected, the signal is provided on line 152 to a SET input to flip-flop 150, for example. The delay feature mentioned in conjunction with Fig. 4b may similarly be used in Fig. 4c to assure that flip-flop 150 will not be reset unless a trailing edge, and not a perforation, has actually been detected. The result of the delay combination, utilizing delay element 154 and AND gate 156 is provided on line 158 to a RESET input for flip-flop 150.

Similarly, the step motor may be activated subsequent to each activation of the print hammer, or by a special decoding circuit detecting the existence of blank characters in buffer 132. Where a special blank character exists on a print wheel, the utilization of the output signal in Fig. 4b, after a slight delay, to step the drive motor provides a simple control over the document conveying means.

In addition to providing signals for control-

ing the various elements shown in Fig. 4b, the microprocessor 110 further participates in generation of instructions for the operator. Specifically, five keys are provided on keyboard 34, each associated with a display light indicative of a particular condition. Two keys are provided for activation by the operator as an indication and identification of the specific printer station. Thus, in a banking institution where a teller terminal is utilized to handle the financial transaction and provide output information summarizing the transaction, it is possible that two teller windows, each associated with a printing station, may cooperate with the teller terminal. The individual printers may be identified by depressing one or the other of the two keys provided for that purpose. A third key is provided for a lamp test by the operator, causing all lamps and indicators to activate. A fourth key is provided for self-testing the apparatus, whereby the various functions thereof may be exercised by the microprocessor. Finally, a fifth key is provided permitting the operator to reset the printer in the event of error conditions.

Additionally, five displays are provided in association with the keys. Two display lights are utilized to identify the particular station. A third light is utilized to instruct the operator to insert the document. A fourth light is used to provide instructions to the operator to remove the document from the printer. Finally, a fifth light indicates the existence of an error condition in the printer. An error indication may be given, for example, in the event that information for printing is stored in the buffer and the trailing edge of the document has already been detected after the appropriate delay. The identification lamps, tutorial lamps and error indication lamp operate under the control of microprocessor 110 and may further be responsive to software functions of the associated terminal.

Utilization of a microprocessor permits an increased level of sophistication in the device operation. For example, utilization of a single index on the document may provide a particularly identifiable signal to the microprocessor, and enable printing to be displaced with respect to the preprinted index. The microprocessor and controller may receive additional signals from the keyboard to provide control of the other predetermined functions to be performed by the apparatus. The foregoing specification has thus disclosed a novel printing apparatus for use in cooperation with information sources, such as teller terminals and the like, having simplified structure and versatile capability. The preferred embodiment hereinabove described is intended to be construed by way of illustration, and not of limitation of the invention. Equivalent variations of the described embodiment will occur to those skilled in the art. Such variations, modifications, and equivalents are within the

scope of the invention as recited with greater particularity in the following claims, when interpreted to obtain the benefits of all equivalents to which the invention is fairly entitled.

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#### CLAIMS (11 Jul 1979)

1. A printing apparatus for printing at least one character at at least one preselected location on a document, said apparatus comprising: document conveying means for moving a document along a prescribed path: a printing station along said path including printing means for printing, upon command, said at least one character at said preselected location on the document; and sensing means responsive to a characteristic of the inserted document for generating a sense signal to initiate operation of said printing means and print said at least one character at said preselected location after the document has been conveyed downstream of said sensing means to position said preselected location at said printing station.

2. The printing apparatus as claimed in Claim 1, wherein said document characteristic is the leading edge of the document.

3. The printing apparatus as claimed in Claim 1, wherein said document characteristic is an index mark on the document.

4. The printing apparatus as claimed in Claim 1, wherein said sensing means includes a photodetector located at substantially the same position along said path as said printing means.

5. The printing apparatus as claimed in Claim 4, wherein said conveying means is located at substantially the same position along said path as said printing means.

6. The printing apparatus as claimed in Claim 1, wherein said printing means includes: a printing wheel having a plurality of characters thereon; a selection motor for rotating said printing wheel to move a selected one of the characters to a print position; and identifying means associated with said wheel for identifying which of the characters is in the print position.

7. The printing apparatus as claimed in Claim 6, wherein said identifying means includes: a plurality of coded indicia on said printing wheel; and detecting means adjacent said printing wheel for detecting said indicia and generating a character signal indicative of the character in said print position.

8. The printing apparatus as claimed in Claim 7, wherein said printing means includes: impact means for moving said printing wheel relative to said document to cause said selected character to be printed on the document; and control means for controlling said impact means and said selection motor, said control means including means for comparing said character signal with a signal corresponding to the desired character and for energizing said selection motor until said signals corre-

spond, said control means being responsive to said sense signal to energize said impact means when said desired character is in said print position and the preselected position on the document is at said printing station.

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9. The printing apparatus as claimed in Claim 1, wherein said document conveying means includes: a stepping motor for advancing a document by discrete steps for each activation of said stepping motor; a drive roller driven by said stepping motor for engaging a document; and an idler roller opposite said drive roller for forcing said document against the surface of said drive roller.

10. The printing apparatus as claimed in Claim 9, wherein said idler roller is spring biased toward said drive roller, but movable away from said drive roller such that documents of various thicknesses may be conveyed.

11. The printing apparatus as claimed in Claim 10, wherein said sensing means includes counting means for counting successive operations of said stepping motor after initial detection of said characteristic of an inserted document, said sensing means generating said sense signal only after counting a predetermined number of operations of said stepping motor corresponding to the number of said discrete steps between detection of said characteristic and said preselected position on the document arriving at said printing station.

12. The printing apparatus as claimed in Claim 7, wherein said sensing means includes: means for differentiating between the detection of the passing of the leading edge of a document and the passing of an index on the document; and counting means for counting successive operations of said stepping motor after detection of an index on the document, said sensing means generating said sense signal only after counting a predetermined number of operations of said stepping motor corresponding to the number of said discrete steps between the index and said preselected position on the document.

13. The printing apparatus as claimed in Claim 9, wherein said document is guided along said path solely by said drive roller and said idler roller, and said document is confined, adjacent its planar surfaces, by the walls of a channel-shaped member, whereby documents wider than the width of said rollers and of said walls may be inserted between said walls and conveyed along said path.

14. The printing apparatus as claimed in Claim 9, wherein said drive roller and said idler roller are located at substantially the same position along said path as said printing means.

15. The printing apparatus as claimed in Claim 1, including enabling means for selectively initiating the operation of said conveying means.

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16. The printing apparatus as claimed in Claim 15, wherein said enabling means is manually operable.

17. The printing apparatus as claimed in Claim 8, wherein said control means includes means for receiving information indicative of the characters to be printed from a transaction control means.

10 CLAIMS (1 Oct 1979)

Each of claims 11 and 12 should be dependent upon claim 9.

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