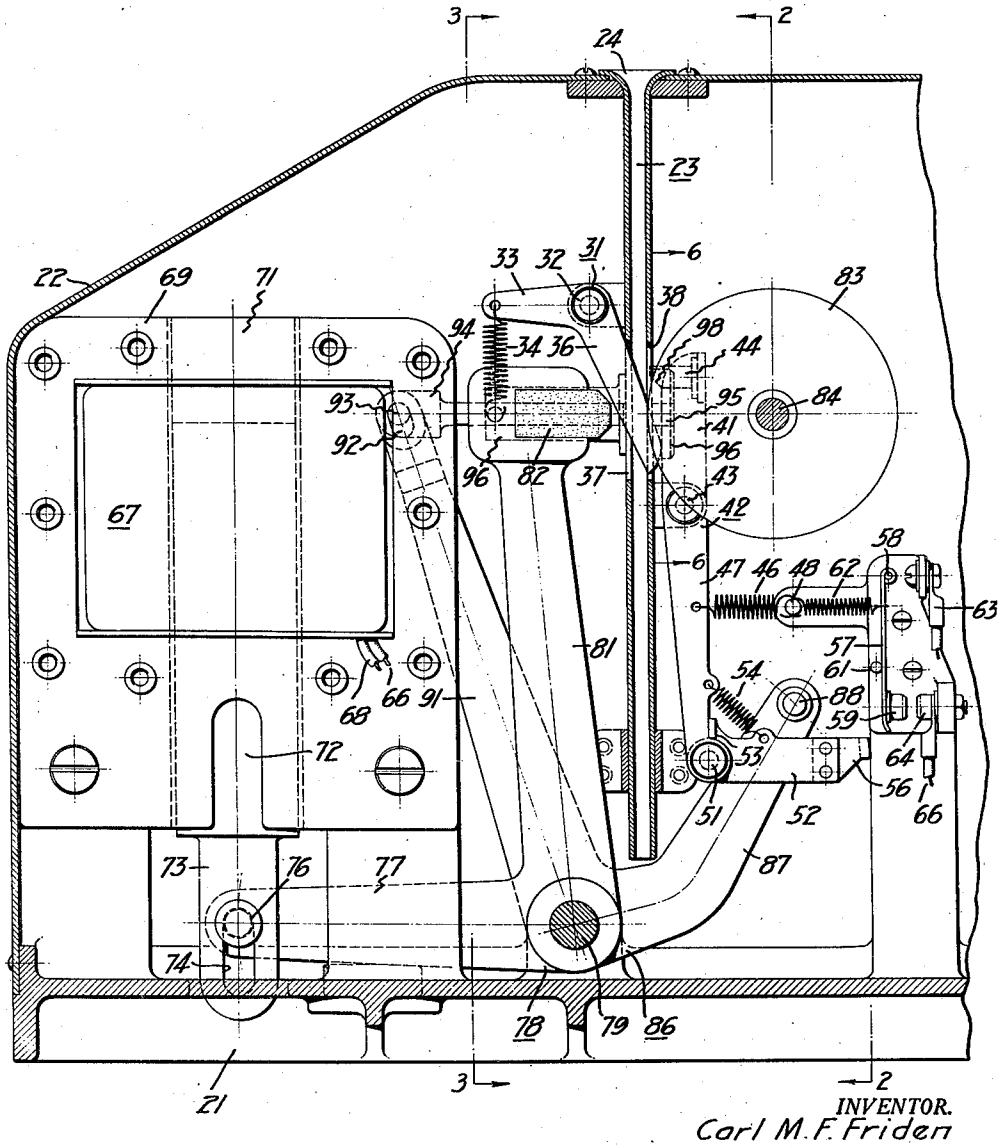
Dec. 3, 1935. C. M. F. FRIDEN 2,023,130

CARD PRINTER

Filed Oct. 30, 1931 4 Sheets-Sheet 1

FIG. 1



INVENTOR.
Carl M. F. Friden

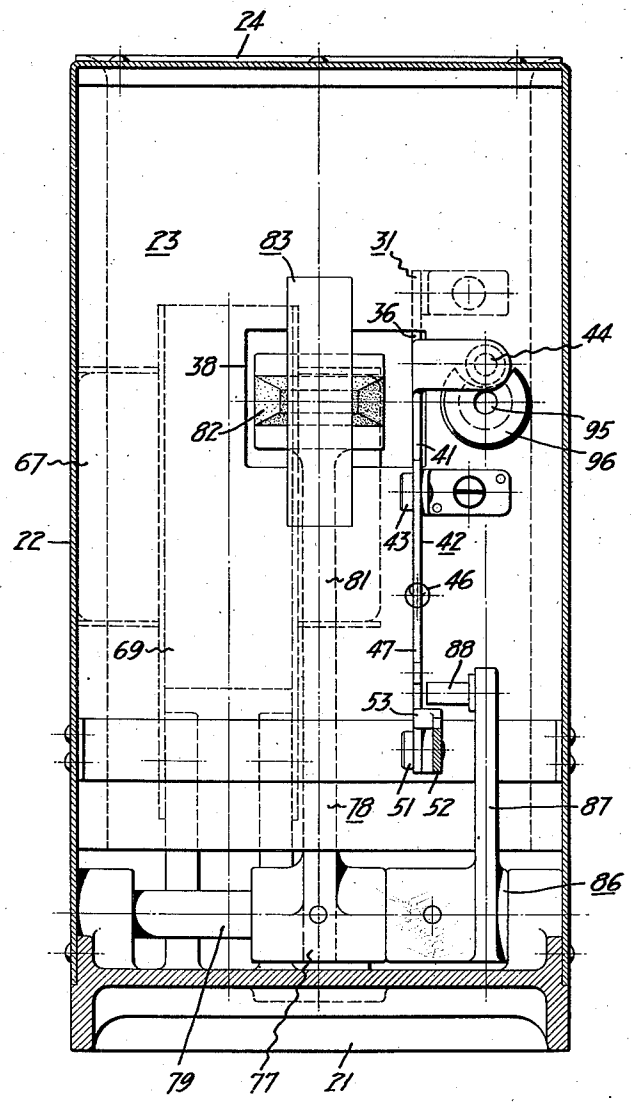
BY White, Prust, Fleck & Lothrop
ATTORNEYS.

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CARD PRINTER

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FIG. 2.



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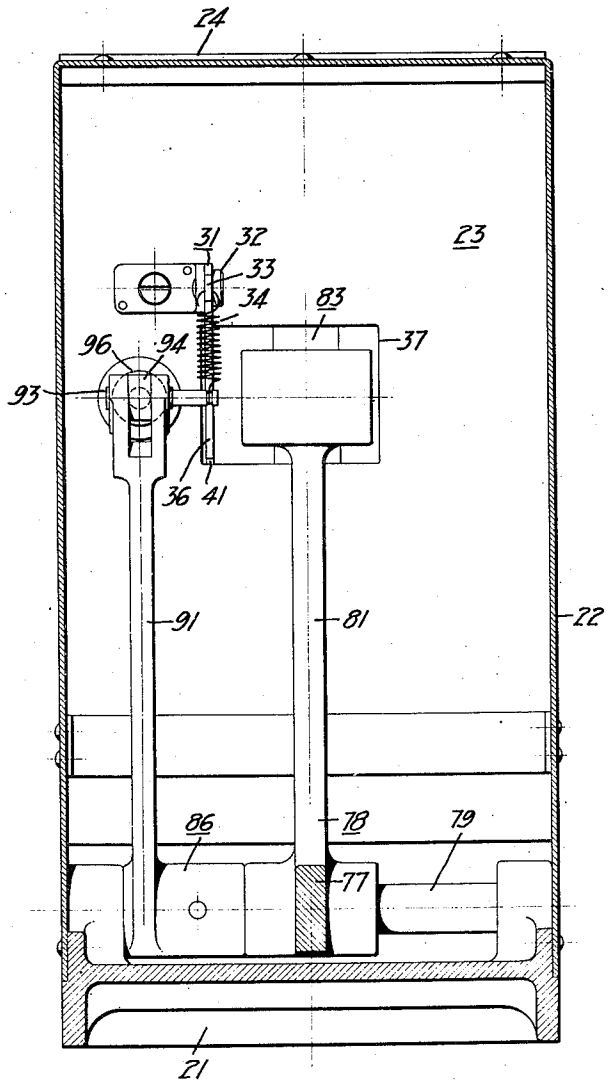
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FIG. 3.



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FIG. 4.

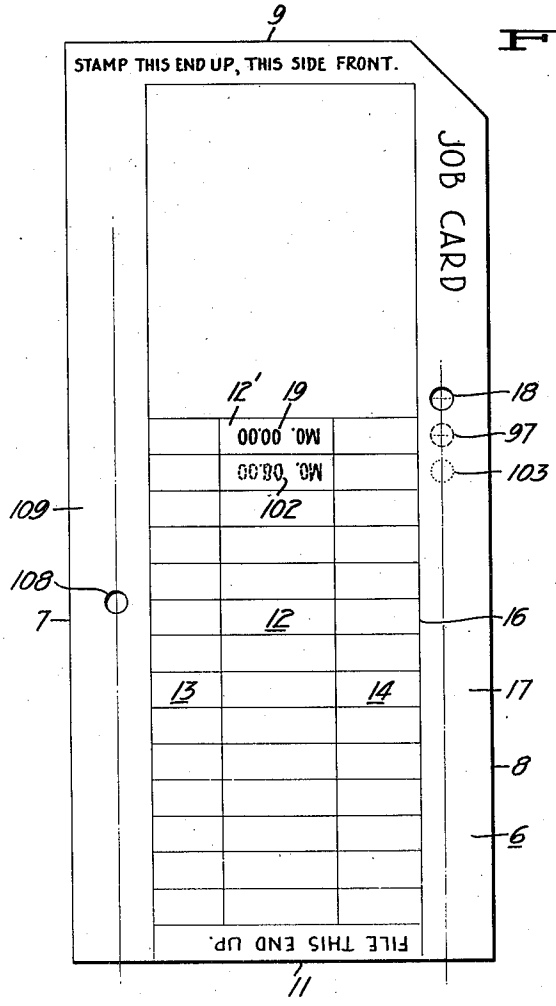


FIG. 5.

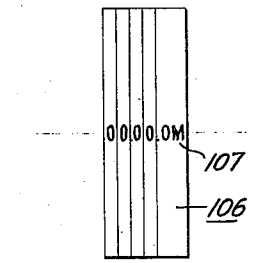
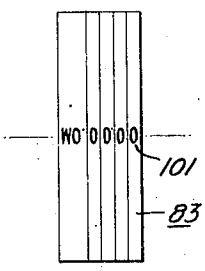


FIG. 6.



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Patented Dec. 3, 1935

2,023,130

UNITED STATES PATENT OFFICE

2,023,130

CARD PRINTER

Carl M. F. Friden, Piedmont, Calif., assignor to Kenneth S. Thomson, Oakland, Calif., as trustee

Application October 30, 1931, Serial No. 571,977

14 Claims. (Cl. 101—287)

My invention relates to recording devices and primarily to devices for recording indicia such as indications of time upon a sheet or other suitable indicia receiver.

It is an object of my invention to provide means for imprinting a suitable indicium or suitable indicia upon a sheet such as a card.

Another object of my invention is to provide a card printer which will automatically imprint upon a card or other sheet in a desired or predetermined location.

Another object of my invention is to fix the location of a card, with regard to matter to be imprinted thereon.

Another object of my invention is to provide a card printer adapted to operate upon the insertion of a card therein to provide an imprint upon the card.

A further object of my invention is to prevent more than one imprint on the card for one insertion thereof into the machine.

An additional object of my invention is to provide a card printer which will print consecutively a number of indicia in a predetermined and fixed order and arrangement.

The foregoing and other objects are attained in the embodiment of the invention shown in the drawings, in which

Figure 1 is a cross section on a vertical longitudinal plane of a card printer constructed in accordance with my invention, certain portions being shown diagrammatically and other portions being broken away to increase the clarity of the disclosure.

Figure 2 is a cross section, the planes of which are indicated by the lines 2—2 of Figure 1.

Figure 3 is a cross section, the plane of which is indicated by the lines 3—3 of Figure 1.

Figure 4 is a plan of a card suitable for use in connection with the card printer of my invention.

Figure 5 is a schematic showing of an arrangement of printing wheels suitable for use in my card printer.

Figure 6 shows an alternative form of arrangement of the printing wheels.

In its preferred form, the card printer of my invention includes mechanism for imprinting on a card which is introduced into the machine and comprises means for fixing the position or arresting the movement of the card entering the machine and holding the card while a single imprint is made thereon and likewise includes means for conditioning the card for a subsequent imprint.

Although the card printer of my invention is adapted to a number of variations and is susceptible to use in a number of different environments, I have chosen to describe it herein as it is utilized in connection with the imprinting of time indicia on a card substantially of the character shown in Figure 4. The card comprises a sheet 6 usually of paper or any other suitable material and is usually of rectangular shape bounded by side edges 7 and 8 and by a top edge 9 and a bottom edge 11. Customarily the card is previously imprinted in columnar form to provide a plurality of areas 12 for the reception of the desired indicia and is likewise provided with additional areas such as 13 and 14 for the reception of additional indicia. Preferably spaced from the side edge 8 is a ruling 16 to bound a marginal area 17 which is designed to be provided with or to receive irregularities which play an important part in the operation of my card printer. In the present instance, the irregularity takes the form of an aperture 18 which is located within the marginal area 17 and is positioned therein at a given distance from or at a predetermined location with respect to initial area 12' designed to receive the first impression, such as 19. When the card is initially prepared for use in the card printer of my invention, not only are the various areas 12 and 17 established, but likewise one irregularity 18 is provided in a fixed relationship to the first or uppermost area 12'.

The card printer which operates on the card 6 comprises a base 21 of any suitable character which will serve as a framework and a mounting for the mechanism. Removably secured to the base 21 is a housing 22 which not only provides an enclosure for the mechanism, but likewise supports a guide 23 which establishes a predetermined path for insertion of the card 6 into the device. The guide 23 is preferably fabricated of a sheet of metal or other suitable material and establishes an elongated enclosure flared at its entrance 24. The guide 23 extends for almost the entire depth of the machine and is sufficiently long to accommodate substantially the entire length of the card 6. The guide is of such width as to receive the card freely without undue side play.

As the card is inserted into the guide 23 and advances along the path predetermined thereby the leading or lower edge 11 of the card first engages a lever 31 pivoted at 32 on the guide 23 and having an arm 33 biased by a spring 34 so that the lever is urged to rotate about the pin 32 to project the other arm 36 of the lever into the path of the card through a pair of apertures 37 and 38

in the walls of the guide 23. Normally the arm 36 bears against one arm 41 of a lever 42 pivoted as at 43 on the guide 23 so that the arm 41 normally is held in the position shown in Figure 1. In this position, a finger 44 fastened to the arm 41 is held out of the path of the card entering the guide, but as the leading edge of the card rotates the arm 36 out of its normal position, the biasing action of the lever 31 on the lever 42 is removed and the arm 41 rotates about the pin 43, under the bias of a spring 46 fastened to the other arm 47 of the lever 42 and also fastened to a pin 48 on the framework of the machine, thus projecting the finger 44 into the guide 23. Since the spring 46 is inferior to the spring 34, it normally cannot overcome the bias of the spring 34 but only upon the subordination of the arm 36 by the inserted card is the spring 46 effective to project the finger 44.

As the card is advanced into the guide and after the card has forced the arm 36 from its path of advancement, the finger 44 bears against the material of the card and rides thereover until such time as the finger engages the irregularity 18 in the card, in this instance an aperture. Since the aperture 18 is of a sufficient size to accommodate the finger 44, the spring 46 urges the finger 44 therethru and thereby accurately positions the card 7 in place and holds it against accidental dislodgment. Since the card is held stationary in a selected orientation by the finger 44 in engagement therewith thru the aperture 18, I preferably provide means for imprinting upon the card in a predetermined location with respect to the aperture 18.

To this end, the arm 47 at its lower end carries a pivot pin 51 on which a lever 52 is mounted. The lever 52 is provided with a stop 53 normally engaging the arm 47 under the urgency of a spring 54 fastened to the arm 47 and to the lever 52. At its extremity the lever 52 is provided with a block 56 which is adapted to engage a movable arm 57 at one end pivoted as at 58 on the framework of the mechanism and at its other end carrying a movable contact 59. The lever 57 is normally held against a stop pin 61 by means of a spring 62 fastened to the pin 48 and to the lever 57. The contact 59 is included in an electric circuit through the lever 57 by means of a lead 63 extending to a suitable source of electromotive force. As the spring 46 rotates the lever 42 about the pin 43 and the finger 44 engages through the aperture 18 in the card 6, the block 56 contacts the lever 57 and against the urgency of the spring 62 forces the lever 57 away from the stop pin 61 so that contact 59 is placed in abutment with a stationary contact 64 mounted on but insulated from the support of the lever 57. Contact 64 is connected by a lead 66 to an electromagnetic coil 67 from which the circuit is completed to the source of electromotive force by a lead 68.

When contacts 59 and 64 are in abutment the circuit is closed through the electromagnetic coil 67 and a magnetic flux is established throughout a field piece 69 mounted on the base 21 and suitably formed to provide a central passageway 71 for a movable core 72. The core 72 is provided at its lower end with an extension 73 having an elongated slot 74 therein through which a pin 76 passes. The pin is mounted on one arm 77 of a bell crank 78 fastened to a shaft 79 journalled in the base 21. The other arm 81 of the bell crank 78 at its upper end carries a hammer block 82 adapted to operate through the aperture 37 in the guide 23 and to press a card therein against one or more type wheels 83 or other suitable indicia imprinting members.

The type wheels can be of any desired form and in any desired arrangement customary for imprinting and in the present instance there are shown five type wheels arranged on a shaft 84. These type wheels are actuated by any suitable mechanism which forms no part of the present invention and therefore is not described herein in detail. Although not shown, there is likewise provided, if desired, any suitable ribbon or other mechanism for inking the type wheels 83.

When the coil 67 is energized, the core 72 is drawn into the passage 71 and the lost motion afforded by the elongated slot 74 is taken up so that the arm 77 of the bell crank 78 is rotated clockwise, as seen in Figure 1, and carries with it the arm 81 of the bell crank so that the hammer block 82 strikes or forces the card within the guide 23 against the type wheels 83 and an imprint of any suitable indicia is made thereon in a predetermined location with respect to the location of the aperture 18 in the card.

I preferably provide means for breaking the electric circuit energizing the coil 67 slightly before or as soon as the imprint has been made, and to this end mount on the rotatable shaft 79 a second bell crank 86 which revolves with the shaft 79 and simultaneously with the rotation of the bell crank 78. The bell crank 86 is provided with an arm 87 at its extremity carrying a pin 88 designed to engage the lever 52 when the bell crank 86 approaches the end of its movement.

The final movement of the bell crank 86 causes the pin 88 to engage the lever 52 and to lower the block 56 at the end of the lever by rotating the lever about its pivot pin 51 so that the block 56 then lies below the extremity of the lever 57. This moves the stop 53 away from the arm 47 and tensions the spring 54. Since the block 57 then exercises no further restraint upon the lever 57, the spring 62 is effective to return the lever 57 to its position against the stop 61 and moves the contact 59 from abutment with the contact 64 breaking the circuit and de-energizing the electromagnet 67.

When the coil 67 is de-energized, the core 72 drops gravitally and the pin 76 then comes into engagement with the upper extremity of the elongated slot 74 causes the lever 77 to rotate anti-clockwise, as seen in Figure 1, and to rotate the shaft 79. This movement removes the hammer block 82 from contact with the card, and likewise lifts the pin 88 from the lever 52. The lever 52, however, is ineffective again to close the circuit inasmuch as in its lifting or rising movement it abuts the end of the lever 57 and has no force component effective to close contacts 59 and 64, thus preventing more than one impression by preventing another closure of the contacts, before all of the parts have returned to their original or normal positions.

In accordance with my invention, I likewise provide a means for conditioning the card 6 or providing the card 6 with an additional irregularity so that upon a subsequent insertion of the card into the machine, the additional irregularity will serve as a locating means for a subsequent imprint in column order with respect to the imprint just effected. To this end, the bell crank 86 is provided with an arm 91 which at its upper end is slotted, as at 92, to receive a pin 93 at one end of a plunger 94. The plunger 94 is translatable in a sleeve 96 fastened to the

guide 23 and at its forward end is designed to work through the guide 23 and to cooperate with a bore 95 in an anvil 96 mounted on the far side of the guide 23. Upon movement of the plunger 94 into and partially through the aperture 95 in the anvil 96, an interposed card is perforated at a point such as 97, having a predetermined relationship to the previous perforation 18 in the card, and likewise having a predetermined locational relationship to the next area 12 for receiving a successive indicia imprint.

Since the arms 81 and 91 are mounted to rotate simultaneously with the shaft 79, the perforation 97 in the card 6 is made at about the same time the hammer 82 causes an imprint thereon. The return movement to normal position of the hammer 82 is likewise substantially accompanied by a return movement of the plunger 94 to its original position, the card is therefore free from contact with any mechanism projecting into its path within the guide 23 except that the finger 44 is still engaged with the aperture 18, under the urgency of spring 46.

In order that the card may be removed, I preferably form the finger 44 with a beveled lower face 98 having such an inclination or slope that an upward pull on the card serves to rotate the lever 42 in a clockwise direction, as seen in Figure 1, against the urgency of spring 46 so that the card is easily removed. As the card is retracted upwardly the spring 34 becomes effective to rotate the lever 31 about the pin 32 so that the arm 36 again engages the arm 41 as the card is withdrawn and holds the finger 44 out of the path defined by the guide 23. The mechanism is then entirely restored to the inactive position of the parts as shown in Figure 1, and which is the condition of the machine when there is no card present in the guide 23.

As shown in Figure 6 the numeral wheels 83 preferably bear indicia 101 thereon which are normally inverted so that the machine first prints an indicium 19 in the area 12' in inverted order. When the card is next inserted into the machine, the lower irregularity or aperture 97 causes an actuation of the machine to make an imprint 102 in the area 12 just below the area 12'. At the time of imprint of the indicia 102 a successive aperture, 103, is made below the aperture 97. The indicia 102 thus imprinted usually have a larger numerical value. Thus, when the card is inverted in order to read the indicia 19 and 102 in their usual upright order, the smallest number is lowermost and the largest number is uppermost to facilitate subtraction or other arithmetical operations. If such arrangement of the numbers is of no consequence, I prefer to provide the numeral wheels 106, as shown in Figure 5, in which the indicia 107 are in an upright order and print on the card so that the card need not be inverted in order properly to read the indicia.

When the card 6 is entirely imprinted on one side, it can be provided with an initial aperture 108 within the opposite margin 109 and the reverse side of the card can similarly be imprinted.

By virtue of the card printer of my invention, a card having an initial irregularity thereon can be inserted into the machine and can be imprinted with indicia and further will receive an additional irregularity so that a subsequent insertion of the card into the machine arranges the subsequent imprinted indicia in a predetermined and proper columnar order with respect to the preceding imprint. Furthermore the card is held firmly while the imprint is being effected and the mechanism is arranged so that only a single imprint can be made for each single insertion of the card into the machine.

It is to be understood that I do not limit myself to the form of the card printer shown and described herein, as the invention, as set forth in the following claims may be embodied in a plurality of forms.

I claim:

1. A card printer comprising a guide for a card, electrical means for causing an imprint on a card in said guide, contacts controlling said electrical means, contact controlling means urged into the path of a card in said guide and superior means for urging said contact controlling means out of said path.

2. A card printer comprising a guide for a card, electrical means for causing an imprint on a card in said guide, contacts controlling said electrical means, contact controlling means urged into the path of a card in said guide and superior means on said path for urging said contact controlling means out of said path.

3. A card printer comprising a guide establishing a path for a card, means for causing an imprint on a card in said guide, means urged into said path for controlling said imprint causing means, and superior means for urging said second named means out of said path.

4. A card printer comprising a guide establishing a path for a card, means for causing an imprint on a card in said guide, means urged into said path for controlling said imprint causing means, and superior means in said path for urging said second named means out of said path.

5. A card printer comprising a guide establishing a path for a card, means for imprinting on a card in said guide, means urging into said path for controlling said imprinting means, and means rendered inoperative by a card in said path for urging said controlling means out of said path.

6. A card printer comprising a guide establishing a path for a card, an electric circuit, contacts for controlling said circuit, means effective upon the closure of said circuit by said contacts for imprinting on a card in said guide, means movable to close said contacts and to project into said path, and means for urging said movable means out of said path.

7. A card printer comprising a guide establishing a path for a card, an electric circuit, contacts for controlling said circuit, means effective upon the closure of said circuit by said contacts for imprinting on a card in said guide, means movable to close said contacts and to project into said path, and means in said path for urging said movable means out of said path.

8. A card printer comprising a guide establishing a path for a card, an electric circuit, contacts for controlling said circuit, means effective upon the closure of said circuit by said contacts for imprinting on a card in said guide, means movable to close said contacts and to project into said path, and means rendered inoperative by a card in said path for urging said movable means out of said path.

9. A card printer comprising a guide establishing a path for a card, means for imprinting a card in said guide, means in said path for controlling said imprinting means, and means rendered inoperative by a card in said path for urging said controlling means out of said path.

10. A card printer comprising a guide establishing a path for a card, means for imprinting a card in said guide, means effective when occupying a position in said path for energizing said imprinting means, and means rendered inoperative by a card in said path for urging said energizing means out of said path.

11. A card printer comprising a guide establishing a path for a card, means for imprinting a card in said guide, means for preventing advancement of a card in said path, means effective in the absence of said card from said path to render said preventing means inoperative and effective during the presence of said card in said path to render said preventing means operative, and means to energize said imprinting means during the operation of said preventing means.

12. A card printer comprising a guide establishing a path for a card, means independent of the leading edge of said card for preventing advancement of said card in said path, and means for holding said preventing means normally inoperative but rendered effective upon the advancement of a card in said path to release said preventing means for operation.

13. A card printer for use with a card having an irregularity comprising means for establishing a path for said card, means movable into and out of said path and responsive to said irregularity for preventing advancement of said card in said path and for imprinting said card, and means adapted to be disabled by advancement of said card in said path for holding said movable means out of said path.

14. A card printer for use with a card having an irregularity comprising means for imprinting said card in a position having a predetermined relationship to said irregularity, means for establishing a path for said card, means movable into and out of said path and responsive to said irregularity for preventing advancement of said card in said path and for controlling said means for imprinting said card, and means normally in said path and effective to hold said responsive means out of said path but displaceable out of said path by said card advancing in said path for releasing said responsive means to move into said path.

CARL M. F. FRIDEN.

CERTIFICATE OF CORRECTION.

Patent No. 2,023,130. December 3, 1935.

CARL M. F. FRIDEN.

It is hereby certified that the above numbered patent was erroneously issued to "Kenneth S. Thomson, of Oakland, California, as trustee," whereas said patent should have been issued to International Business Machines Corporation, New York N. Y., a corporation of New York, as assignee by mesne assignments of the entire interest in said invention, as shown by the records of assignments in this office and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 17th day of March, A. D. 1936.

(Seal)

Leslie Frazer
Acting Commissioner of Patents.