

[54] **TRAVELING CYLINDER IMPRINTER HAVING SETTABLE TYPE WHEELS WITH THREE PERIPHERAL SECTORS**

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[58] Field of Search **101/45, 110, 95, 101/99, 269-274, 56, 111**

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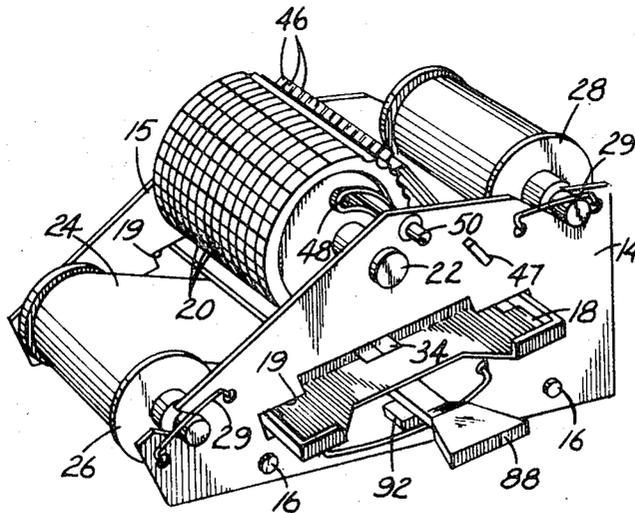
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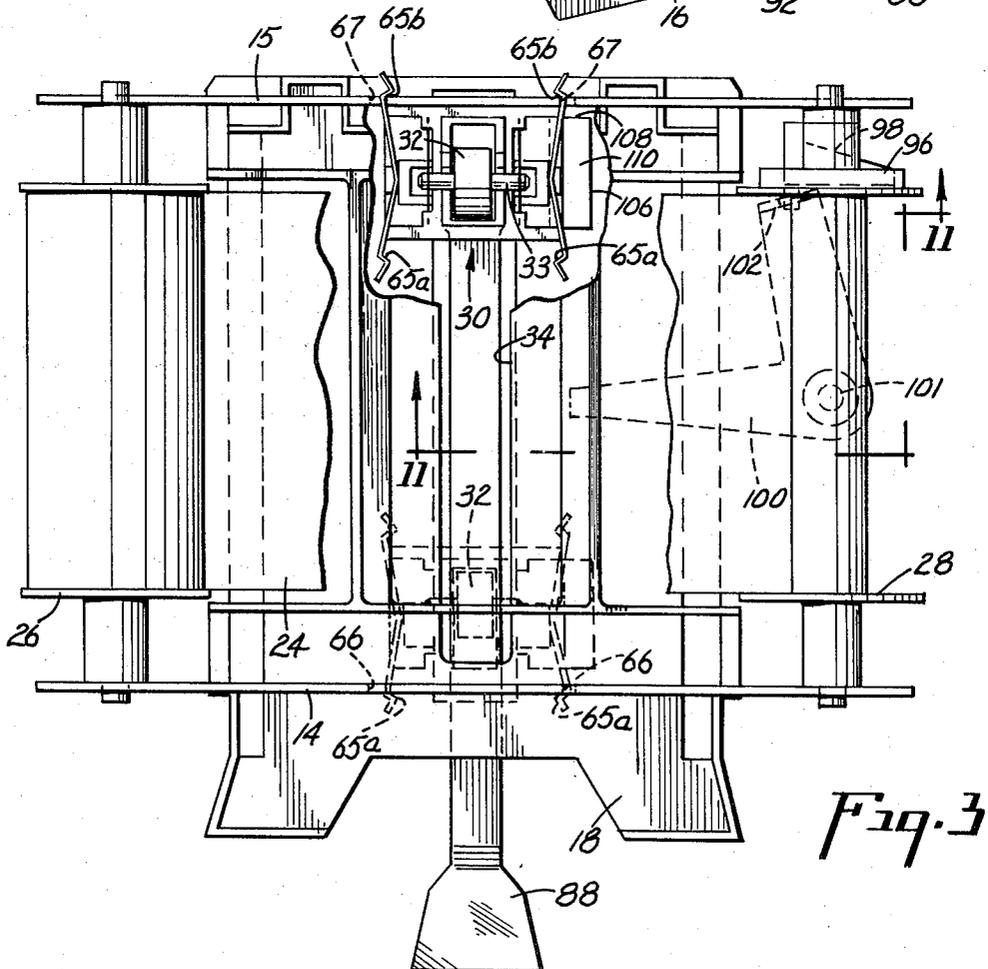
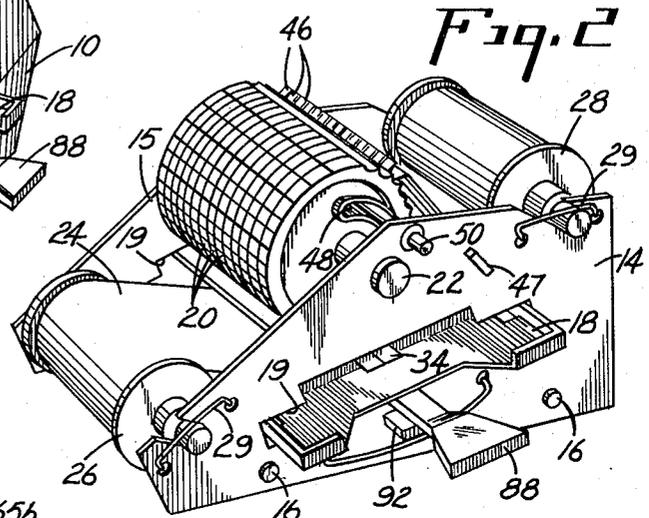
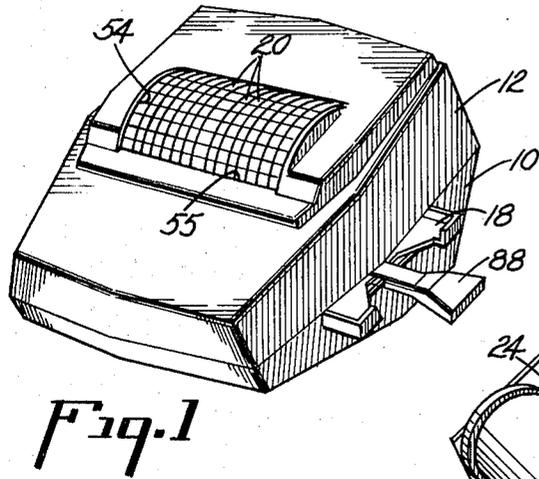
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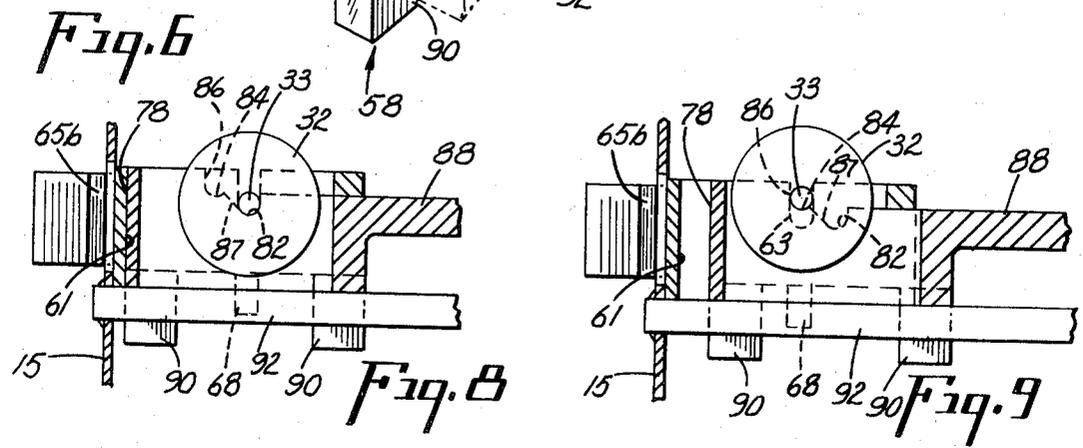
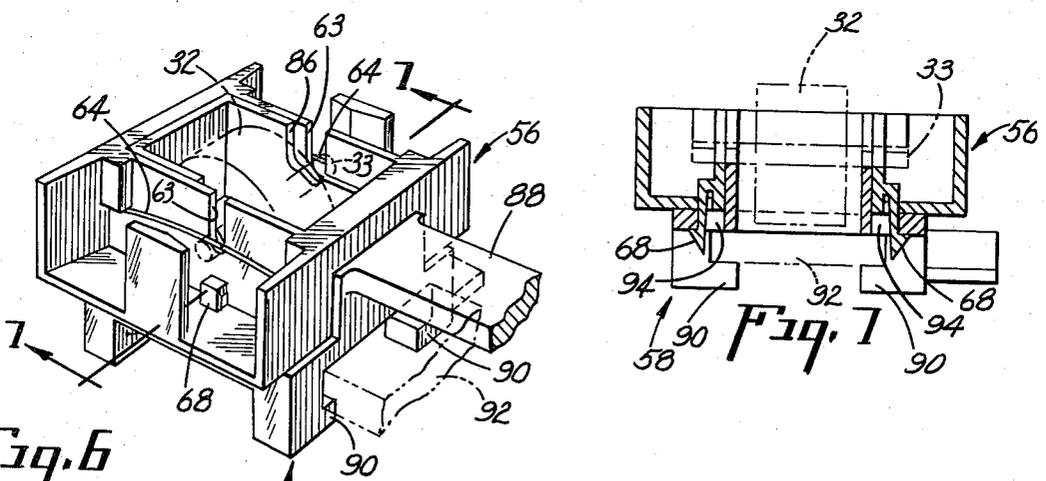
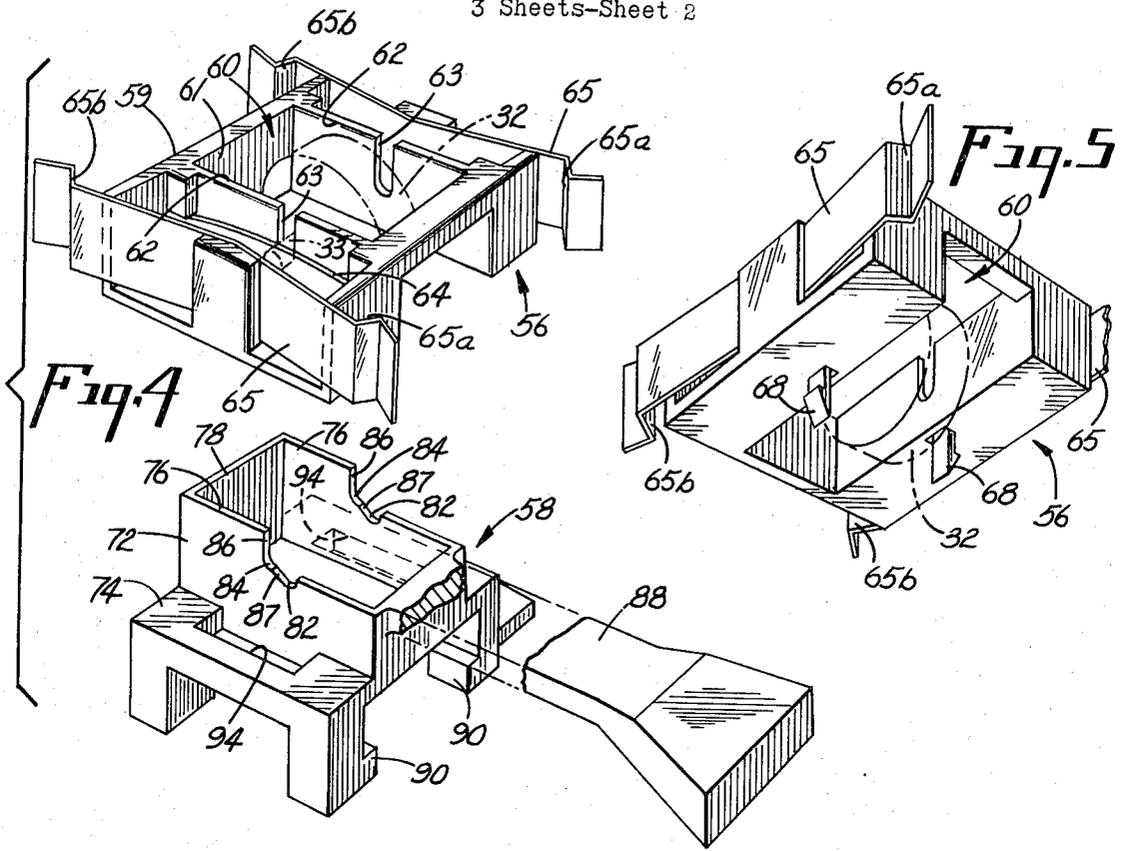
[57] **ABSTRACT**

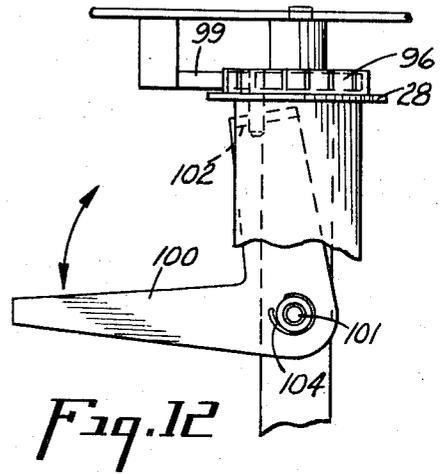
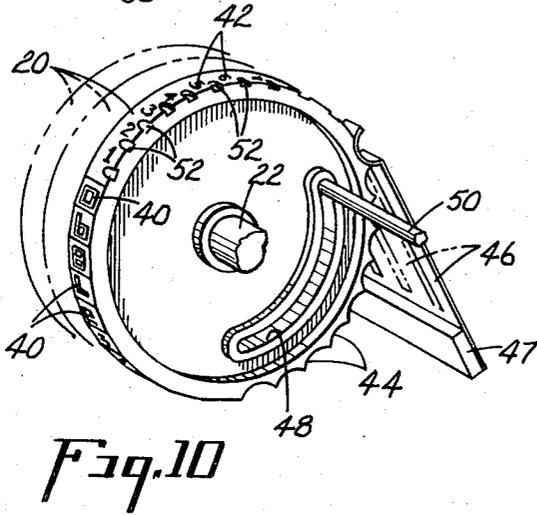
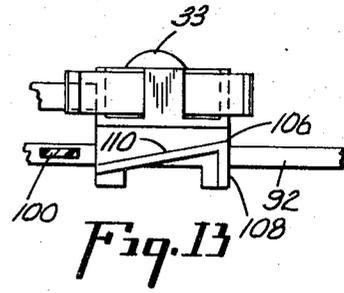
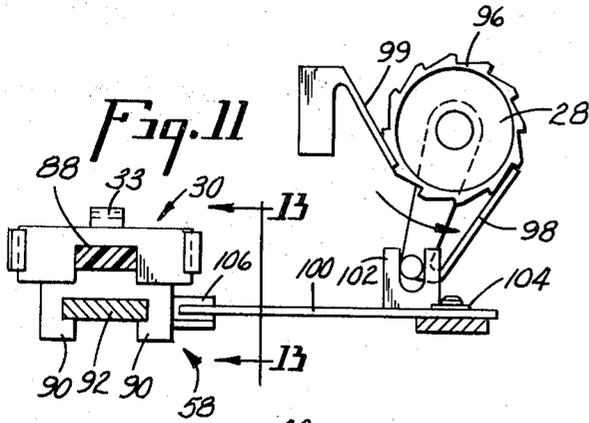
An imprinting device having a frame which mounts a form support bed. The frame also mounts a plurality of printing wheels above the bed. Each of the wheels has one peripheral segment with printing characters thereon, another peripheral segment with visually readable characters therein, and another peripheral segment with detent grooves. The wheels are settable to select desired characters for printing. A platen assembly is mounted beneath the bed and the platen extends through a slot in the bed. The platen assembly includes mounting members which mount the platen for shiftable movement between a printing position and an idling position. The mounting is such to move the platen to the printing position upon movement of the assembly in one direction and from one end and to an idling position upon movement of the assembly in the other direction from the other end. The device also includes an inked printing ribbon which is advanced incrementally upon each printing cycle of the platen assembly.

5 Claims, 13 Drawing Figures









TRAVELING CYLINDER IMPRINTER HAVING SETTABLE TYPE WHEELS WITH THREE PERIPHERAL SECTORS

BACKGROUND OF THE INVENTION

This invention relates generally to imprinting devices, and more particularly to compact relatively inexpensive printing devices suitable for individual home use.

With the increasing number of credit transactions taking place it is becoming increasingly desirable and even necessary to automate the handling of their financial aspects. Such automation includes high-speed handling of payments and the records thereof from the purchaser making such payments. Payments in the past have conventionally been handled principally by checks, which checks by individual consumers are normally handwritten, both as to the payee and the amounts. Since handwriting is not susceptible to machine reading with sufficient precision at the present state of the art, each check must be individually humanly read and the payee and the amount properly entered. Conventional prior art commercial imprinting devices which print machine readable characters are expensive precision machines of heavy duty construction. They are too expensive for home use. Thus a need has arisen for a simple, very inexpensive data recorder which can be mass distributed, and which is economically feasible to be discarded and replaced if malfunctioning occurs rather than requiring expensive repair service.

SUMMARY OF THE INVENTION

According to the present invention, a relatively small, simple, inexpensive imprinting device is provided which is especially adapted for individual use in making payment of various credit accounts.

The device includes a novel platen assembly with a roller platen which is shiftable between a printing position and a non-printing position on forward and reverse strokes of the roller platen in a relatively simple manner. As a second novel tri-function structure, the device also includes print wheels which can be set to print the desired characters with the printing characters being carried on one sector of the periphery, visually readable indicia carried on another sector for easy setting, and detents in still a third section.

The device also includes an inked printing ribbon which is advanced incrementally during each printing cycle of the device.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of an imprinting device according to this invention;

FIG. 2 is another perspective view of the device on a somewhat larger scale from FIG. 1 with the cover removed;

FIG. 3 is a plan view to a larger scale, of the device of FIGS. 1 and 2 partially in section and with parts broken away for clarity of illustration;

FIG. 4 is an exploded view of the platen mounting assembly of the device;

FIG. 5 is a bottom perspective view of the carriage member of the platen mounting assembly;

FIG. 6 is an assembled view of the platen mounting assembly;

FIG. 7 is a sectional view taken substantially along the plane designated by the line 7—7 of FIG. 6;

FIGS. 8 and 9 are longitudinal sectional views, somewhat schematic, showing the operation of the platen mounting assembly;

FIG. 10 is a perspective view of the mounting of the imprinting wheels of the device;

FIG. 11 is a sectional view taken substantially along the plane designated by the line 11—11 of FIG. 3 showing the ribbon advancing mechanism;

FIG. 12 is a plan view of the parts shown in FIG. 11 of the ribbon advancing mechanism; and

FIG. 13 is a sectional view taken substantially along the plane designated by the line 13—13 of FIG. 11.

DESCRIPTION OF THE PREFERRED EMBODIMENT

General Description

Referring now to the drawings, and for the present to FIGS. 1 through 3, an imprinting device according to the present invention is shown. The device includes a frame 10 and a cover 12 removably mounted thereon. The frame 10 includes a pair of side plates 14 and 15 which are secured together by a multiplicity of tie bars 16 extending therebetween.

A form support bed 18 extends between the side plates 14 and 15 and is secured in openings 19 in each of the side plates 14 and 15. The support bed 18 is disposed to support a form, for receiving printing, within the confines of the frame 10.

A plurality of printing wheels 20 are journaled for rotation on an axle 22 secured to the side plates 14 and 15.

A printing ribbon 24 is rolled on a pay-out spool 26 and a take-up spool 28. The ribbon 24 extends from the spool 26 to the spool 28 between the form support bed 18 and the printing wheels 20 to provide ink for printing on the form. The spools 26 and 28 are held in place by spring clips 29.

The device also includes a platen mounting assembly 30 which mounts a roller platen 32 journaled for rotation on a platen shaft 33. The roller platen 32 is disposed to extend through an elongated through slot 34 in the form support bed 18 to roll in contact with a form supported on the bed and effect a printing operation of impressions from the characters on the printing wheels 20.

Printing Wheels

Referring now to FIGS. 2 and 10, each of the printing wheels 20 is formed with three separate segments having different peripheral characteristics. The periphery of one segment contains printing characters 40, the periphery of another segment contains visual reading characters 42 and the periphery of the third segment contains detent grooves 44. As described above the printing wheels 20 are journaled for rotation on the axle 22 to set the desired printing characters in position. (The axle also serves as a tie bar between the side plates 14 and 15.)

The wheels are detented in position by means of spring detent arms 46 extending from a common bar 47 and which arms 46 releasably engage the detent grooves 44 to maintain the printing wheels in the selected position. (The bar 47 also serves as a tie bar.) The printing position of each character is that in which the printing character is aligned with the slot 34 in the bed 18.

In order to restrict movement of the printing wheel to only that which is required to move each of the printing characters to the printing position the wheels are formed with arcuate slots 48, and a stop rod 50 extends through the arcuate slots 48 to thereby limit the amount of travel possible for each printing wheel.

To facilitate the setting of the print wheels and allow the print wheels to be disposed in relatively close association and be of minimal size, stylus holes 52 are formed in the periphery adjacent each of the visually reading characters 42. This allows a pointed stylus to be inserted into the holes to set the desired characters.

As can be seen in FIG. 1 the cover 12 has an opening 54 formed therein through which the printing wheels 20 project to display the visually reading characters 42. One edge 55 of the opening serves as a guide to indicate which printing character 40 is in the printing position, that printing character corresponding to the visual character 42, aligned with the edge 55. The edge 55 also serves as a stop against which the stylus hits, so that when the stylus is inserted in the proper stylus hole adjacent the selected character, rotation of the wheels by the stylus will automatically set the desired character in the printing position.

Platen Mounting Assembly

Referring now to FIGS. 3 through 9, the platen mounting assembly and platen are shown in detail. The platen mounting assembly has first and second platen mounting members in the form of a carriage member designated generally as 56 and an actuating member designated generally as 58.

The carriage member 56 includes a frame 59 having a central opening 60 defined by a rear wall 61 and a pair of side walls 62. Each of the side walls 62 has a vertically extending guide slot 63. A platen shaft 33 of roller platen 32 resides in the guide slots 63. Wire springs 64 secure the shaft 33 within the slot 63.

Refer to FIG. 3. A pair of latching springs 65 are provided on the opposite sides of the carriage member 56. The latching springs 65 each have one end portion 65a disposed to engage spring engagement surfaces 66 formed in the side plate 14 and opposite end portions 65b disposed to latchingly engage spring engaging surfaces 67 in the side plate 15. These latching springs are shown in FIG. 3 engaging the spring engaging surfaces 66 in solid outline and engaging the spring engaging surface of 67 in dotted outline.

As can best be seen in FIG. 5, the carriage member 56 also includes a pair of downwardly extending resilient engagement catches 68. These catches are for mounting the carriage member 56 on the actuating member 58.

The actuating member 58 has an upper platen receiving section 72 and a lower guide section 74. The platen receiving section 72 includes a pair of side walls 76 and a rearward end wall 78. The side walls 76 each have a pair of lower cam slots 82 and upper cam slots 84. Rearwardly of the cam slots 84 in each side wall is a vertically extending actuating surface 86. Sloping cam surfaces 87 connect the lower cam slots 84 and the upper cam slots 86. A handle 88 extends from the upper guide section 74.

The guide section 74 is provided with a plurality of guide flanges 90 which slidably engage guide track 92 extending between the side plates 14 and 15. The guide section 74 also includes a pair of longitudinally extending openings 94 for receiving the engagement catches

68 of the carriage member 56. In their assembled relationship the carriage member 56 slips over the actuating member 58. The platen receiving section 72 of the actuating member is disposed in the opening 60 of the carriage member 56. The engagement catches 68 of the carriage member 56 extends through the openings 94, in the actuating member 58. This mounting of the carriage member 56 and the actuating member 58 allows for limited sliding movement of the carriage member 56 with respect to the actuating member 58 as is illustrated in FIGS. 8 and 9 to which Figures reference is now made.

As shown in FIG. 8, the end wall 78 of the actuating member 58 is abutting wall 61 of the carriage member 56. In this position the platen shaft 33 is residing in the lower cam slots 82 of the actuating member which thus defines a lower position for the roller platen 32. When the actuating member 58 is moved relative to the carriage member from the position shown in FIG. 8 to the position in FIG. 9 the platen shaft 33 will ride up the sloping cam surfaces 87 and engage in upper cam slots 84 and in abutment with the actuating surfaces 86.

The platen is caused to elevate to a printing position by causing relative movement of the actuating member 58 with respect to carriage 56. The relation movement is caused by pulling handle 88 while latch spring 65 retains the carriage 56.

The guide slots 63 formed in the carriage member 56 guide the shaft 33 with the platen 32 in a vertical direction as the movement of the actuating member 58 with respect to the carriage member 56 occurs. The cam slots and cam surfaces act to raise and lower the roller platen. The position of the platen on the assembly 30 is such that when the platen 32 is in the position shown in FIG. 9, it will extend completely up through the slot 34 pushing the form firmly against the printing wheels 20. However, when the platen 32 is in the position shown in FIG. 8, it will be sufficiently spaced from the form so as to not press it against the printing wheels or the ribbon 24, thus constituting a non-printing or idling position.

Ribbon Advancing

Referring now to FIGS. 2, 3 and 10 through 13, the ribbon advance mechanism is shown in detail. The ribbon advance mechanism includes a sprocket 96 fixed on the take-up spool 28. The sprocket 96 is operated by an advancing pawl 98 which is pivotally mounted and a latching on the take-up spool dog 99. The advancing pawl 98 is actuated by an operating arm 100 which is pivotally mounted on a pivot pin 101 for pivotal movement in a plane generally parallel with the bed 18. The arm 100 is relatively rigid in the plane of its pivotal movement and relatively flexible in the plane transverse thereto. The operating arm 100 carries an actuating yoke 102 engaging the advancing pawl 98 so that pivotal movement of the operating arm 100 in a clockwise direction as viewed in FIG. 12 will cause the advancing pawl 98 to rotate the sprocket 96. Return movement in a counterclockwise direction under urging of return spring 104 will cause the advancing pawl 98 to override the teeth of the sprocket with the latching dog holding the sprocket in position. Thus oscillating movement of the arm in a well known manner will incrementally rotate the sprocket 96, thus incrementally rotating the take-up spool 28.

The operating arm 100 is actuated by means of operating block 106 carried by the actuating member 58 of

the platen mounting assembly 30. The operating block 106 has generally vertically extending actuating surface 108 on the forward edge thereof and an override surface 110 sloping generally downwardly and away from the actuating surface 108. Thus upon movement of the platen mounting assembly 30 from the position shown in dotted outline in FIG. 3 to that shown in solid outline in FIG. 3, the actuating surface 108 of the operating block 106 will engage the operating arm 100 and rotate it to advance the ribbon one increment. Conversely, movement of the platen mounting assembly 30 from the position shown in solid outline to the position shown in dotted outline in FIG. 3 will cause the sloping override surface 110 to engage the operating arm 100. Since the operating arm 100 is formed of a material which is flexible in a plane transverse to the plane of the bed, the override surface will cause the arm 100 to flex upwardly and thus override the operating block so that no effect or actuation of the sprocket 96 occurs. Thus movement of the platen mounting assembly 30 in one direction will cause an incremental advance of the ribbon while movement in the opposite direction will have no effect on the ribbon.

Operation

Assume for start of a printing function the device is as generally shown in FIGS. 1, 2 and 3. In order to imprint the desired characters, the form is first inserted onto the bed 18 so that it is below the ribbon 24 and the printing wheels 20. The characters which it is desired to print are then selected by inserting a stylus into the stylus holes 52 and printing wheels 20 turned to show the desired characters above the edge 55. The handle 88 is then grasped and pulled in a direction (downwardly as viewed in FIG. 3) to urge the platen mounting assembly 30 to move from the position shown in solid outline constituting a home position to the position shown in dotted outline constituting an actuated position in FIG. 3. As can be seen in FIG. 3, the latching springs 65 are engaging the latching spring engagement surfaces 67 of the side plate 15. The sliding fit of the actuating member 58 with respect to the carriage member 56 is such that it takes less force to slide the actuating member 58 in the carriage member 56 from the position shown in FIG. 8 to the position shown in FIG. 9 than it does to release the detenting or latching action of the latching springs 65. Hence upon downward movement of the handle 88 (as viewed in FIG. 3) the actuating member 58 will first move with respect to the carriage member 56 from the position shown in FIG. 8 to that shown in FIG. 9, thus raising the platen 32 from the idling position to the printing position before there has been any longitudinal movement of the roller platen 32.

Continued pulling on the handle 88 from this position shown in FIG. 9 will cause the actuating surfaces 86 to bear against the platen shaft 33 and when sufficient force is exerted the action of the latching springs 65 on the spring engaging surfaces 67 will be overcome which will release the carriage member 56 and the entire platen mounting assembly 30 will then move on the track 92 from the solid outline home position in FIG. 3 to the dotted outline actuated position. During this movement the roller platen 32 will be in the upper printing position as depicted in FIG. 9 and will rollingly press the form through the slot 34 against the ribbon and printing wheels causing the selected printing characters on the printing wheels 20 to print through the

ribbon 24 onto the form. During this movement the override surface 110 of the operating block 106 will override the operating arm 100; therefore no actuation of the arm will occur. This movement of the platen mounting assembly 30 from the home position shown in solid outline in FIG. 3 will continue until it reaches the actuated position shown in dotted outline.

In the actuated position shown in dotted outline in FIG. 3, the latching springs 65 engage the spring engaging surfaces 66 of the side plate 14. Also at the end of the stroke the platen 32 remains in an upward or printing position as shown in FIG. 9. To complete the cycle the platen mounting assembly 30 is returned from the actuated position to the home position. This is done by pushing the handle 88 in an upward direction (as viewed in FIG. 3). When such force is exerted on the handle 88 the latching springs 65 will hold the carriage member 56 in the actuated position and the actuating member 58 will first move with respect to the carriage member 56 from the position shown in FIG. 9 to that shown in FIG. 8. This will cause the platen 32 to drop to its idling position in cam slots 82. When the position shown in FIG. 8 has been reached the end wall 78 of the actuating member 58 will be in contact with the rear wall 61 of the carriage member 56. Continued force on the handle will then overcome the action of the latching springs 65, disengaging them from the spring engaging surfaces 66 and allowing the platen mounting assembly to move from the actuated dotted outline position to the home solid outline position in FIG. 3. This movement will occur with the roller platen 32 in an idling position so that a printing function will not occur. This will prevent a double impression or "shadowed" image from occurring on the form.

Also, during movement from the actuated position to the home position the actuating surface 108 of the operating block 106 will oscillate the operating arm 100 causing an incremental advance of the ribbon thus presenting a new ribbon surface for the next actuation on a printing cycle.

What is claimed is:

1. An imprinting device comprising, a frame, a form receiving bed supported by said frame, said bed having an upper surface disposed to support a print receiving form thereon, said bed having an elongated slot extending therethrough, at least one printing wheel journaled for rotation above said bed, each wheel having three separate angular peripheral sectors of its outer surface, one sector containing a series of outwardly facing printing characters, each selectively positionable in alignment with said slot, another sector containing outwardly facing visually readable characters, indicating means to indicate on the visually readable character sector which printing character is positioned in alignment with said slot, detent means to releasably secure each wheel in any selected character printing position, said detent means including circumferentially spaced engagement surface means on a third outwardly facing peripheral sector of the wheel and releasable contact means positioned to engage said engagement surfaces, a platen assembly disposed beneath said bed, said platen assembly including a roller platen extending into said slot and movable therein on a printing path of travel in printing engagement with said printing characters on each of said wheels, said platen assembly including handle means for moving said roller platen on said path of travel.

2. The invention as defined in claim 1 further characterized by stop means to limit the movement of each wheel within the limits of the printing characters at the printing position.

3. An imprinting device comprising, a frame, a form receiving bed supported by said frame, said bed having an upper surface disposed to support a print receiving form thereon, said bed having an elongated slot extending therethrough, at least one printing wheel journalled for rotation above said bed, each wheel having three separate angular peripheral sectors of its outer surface, one sector containing a series of outwardly facing printing characters, each selectively positionable in alignment with said slot, another sector containing outwardly facing visually readable characters, indicating means to indicate on the visually readable character sector which printing character is positioned in alignment with said slot, detent means to releasably secure each wheel in any selected character printing position, said detent means including circumferentially spaced engagement surface means on a third outwardly facing peripheral sector of the wheel and releasable contact means positioned to engage said engagement surfaces, stop means including an arcuate slot in each wheel, and a stationary stop bar extending through each said slot, and;

a platen assembly disposed beneath said bed, said platen assembly including a roller platen extending into said slot and movable therein on a printing path of travel in printing engagement with said printing characters on each of said wheels, said platen assembly including handle means for moving said roller platen on said path of travel.

4. An imprinting device as set forth in claim 1 wherein each said wheel includes a stylus receiving recess adjacent each said visually readable character for receiving a stylus to impart rotational movement to said wheel for positioning a selected one of said printing characters in alignment with said slot, and means for

limiting travel of said stylus and wheel moved thereby so that the visually readable character adjacent said stylus receiving recess is stopped at a position corresponding with said indicating means.

5. An imprinting device comprising, a frame, a form receiving bed supported by said frame, said bed having an upper surface disposed to support a print receiving form thereon, said bed having an elongated slot extending therethrough, at least one printing wheel journalled for rotation above said bed, each wheel having at least three separate angular peripheral sectors of its outer surface, one sector containing a series of outwardly facing printing characters, each selectively positionable in alignment with said slot, another sector containing outwardly facing visually readable characters, indicating means to indicate on the visually readable character sector which printing character is positioned in alignment with said slot, detent means on a third outwardly facing peripheral sector of the wheel and releasable contact means positioned to engage said engagement surfaces to releasably secure each wheel in any selected character printing position, each said wheel including a stylus receiving recess adjacent each said visually readable character for receiving a stylus to impart rotational movement to said wheel for positioning a selected said printing character in alignment with said slot, means for limiting travel of a said stylus and the wheel moved thereby so that the visually readable character adjacent said stylus receiving recess is stopped at a position corresponding with said indicating means; a platen assembly disposed beneath said bed, said platen assembly including a roller platen extending into said slot and movable therein on a printing path of travel in printing engagement with said printing characters on each of said wheels, said platen assembly including means for moving said roller platen on said path of travel.

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