

[54] **PORTABLE PRINTER FOR PREFORMED CARTONS**

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[58] Field of Search. **101/41, 35, 379, 101/301; 74/603, 604**

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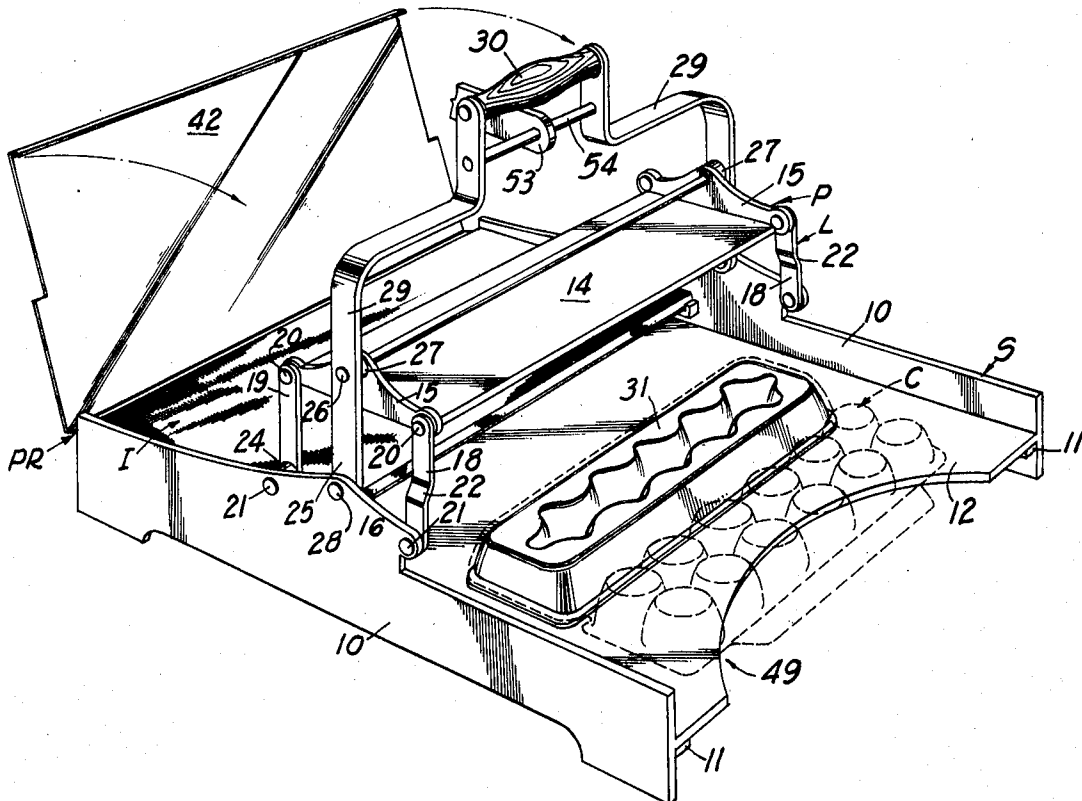
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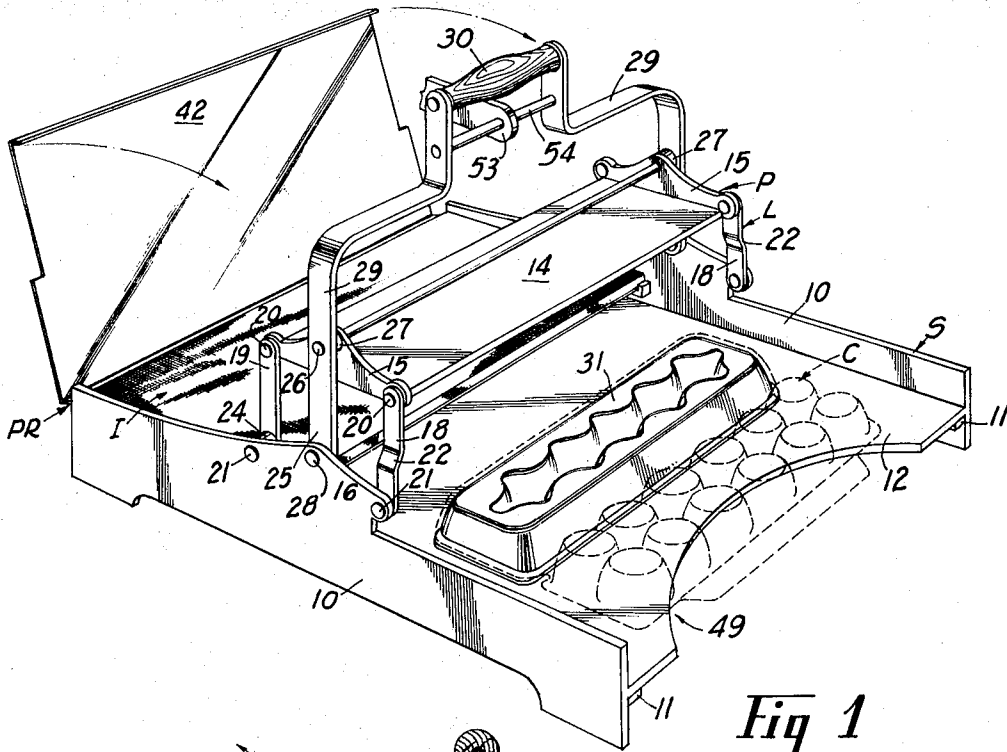
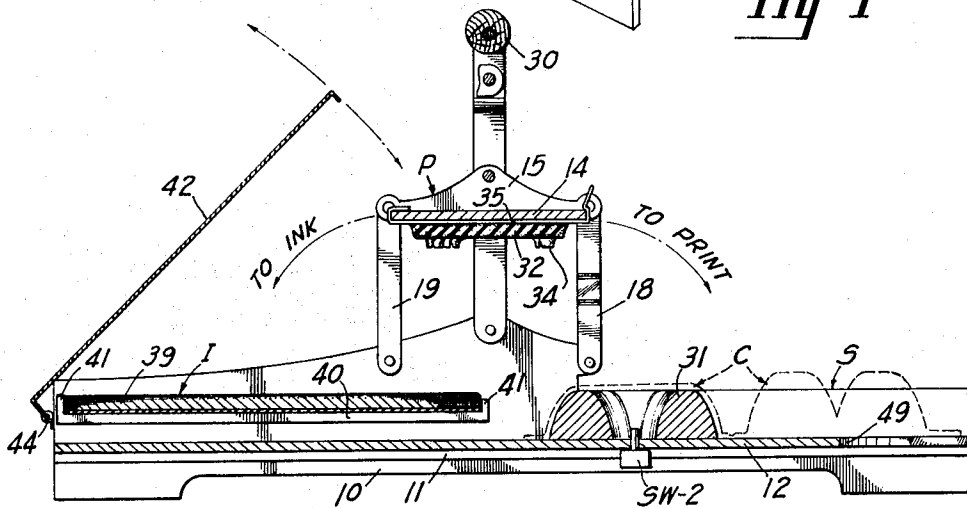
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[57] ABSTRACT

Apparatus for printing invoemation on preformed cartons such as egg cartons in an egg packing plant. The apparatus includes a support framework, a shaped platen for supporting a preformed carton thereon, a printer having information thereon to be printed on the carton, an inker for inking the information on the printer, and a drive for cyclically moving the printer from an inking position to a printing position.

4 Claims, 5 Drawing Figures





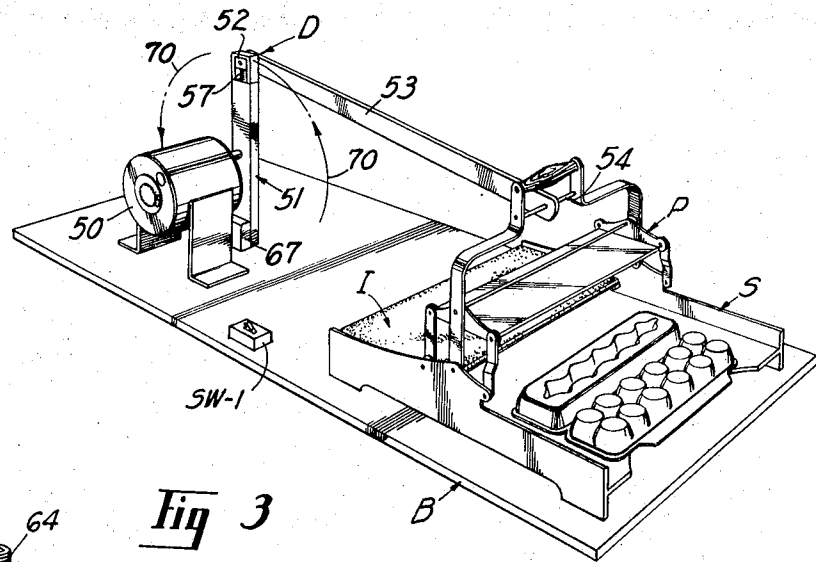
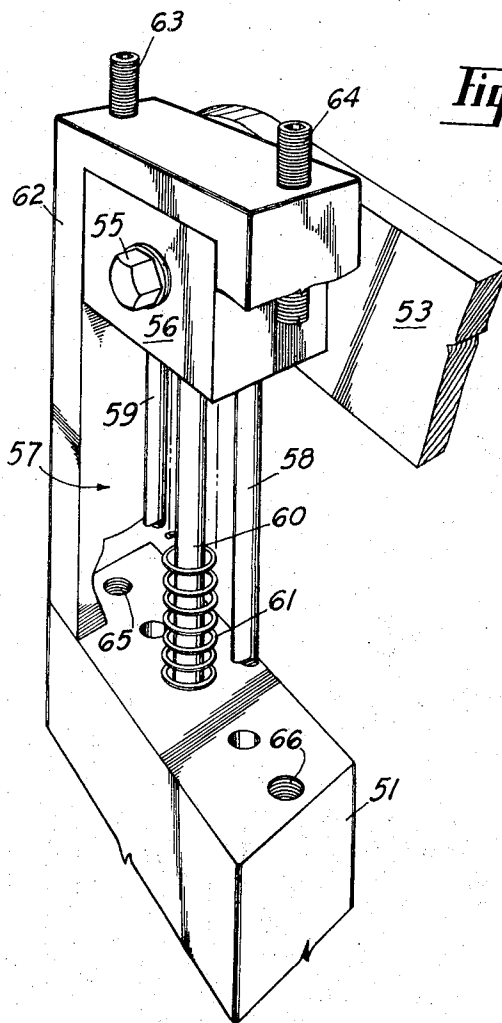
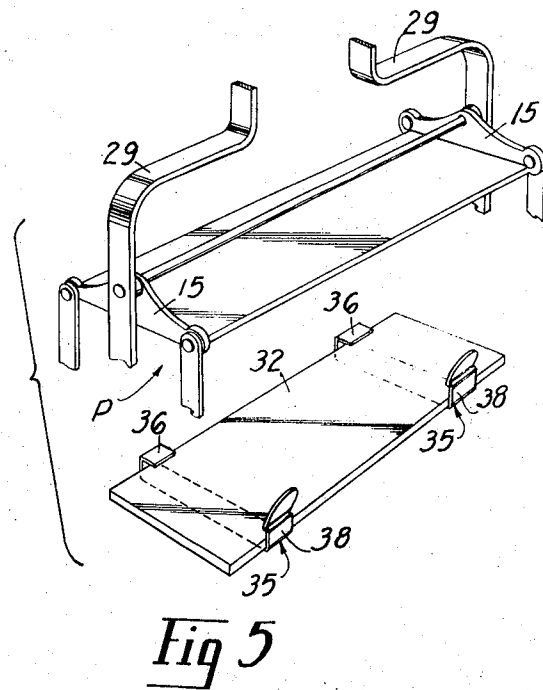
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PORTABLE PRINTER FOR PREFORMED CARTONS

This is a continuation, of application Ser. No. 034,363, filed May 4, 1970 now abandoned.

BACKGROUND OF THE INVENTION

Placing the information on a preformed carton in the past has been a tedious job, especially when using preformed cartons such as egg cartons which have an irregular outer surface. While some attempts have been made to print information onto the preformed cartons using a stencil and inking roller, such attempts have been unsatisfactory in that the printing job was time consuming, alignment of the printed information on the carton was frequently incorrect, and the operator applying the ink to the carton frequently got ink on himself. As a result, the egg packer was forced to buy his cartons preprinted from the carton manufacturer.

While the large egg packer could afford preprinted cartons, the small packer could not, since preprinted cartons are expensive unless ordered in extremely large quantities and since the time delay between ordering and shipment of such cartons required eight to ten weeks anticipation of carton requirements. This forced the small packer to sell his eggs only through a large packer, thereby considerably reducing this profit margin.

OBJECTS OF THE INVENTION

These and other problems and disadvantages associated with the prior art are overcome by the invention disclosed herein in that the method and apparatus for printing the carton is easily transportable between locations, is simple and inexpensive to operate, and the information printed thereby can be quickly and easily changed.

Therefore, it is a primary object of the invention to provide a method of printing preformed cartons which is inexpensive to carry out.

Another object of the invention is to provide a method of printing preformed cartons in the egg packing plant.

A still further object of this invention is to provide a method for printing preformed cartons which is simple to carry out in the egg packing plant.

The further object of this invention is to provide a method for printing preformed cartons which is economical for use on a limited volume basis.

A still further object of this invention is to provide a printer for preformed cartons which is highly portable.

A still further object of this invention is to provide a printer having a releaseably secured character bearing printing element.

Another object of this invention is to provide a printer having ink pad means operatively associated with a movable printing element.

An additional object of this invention is to provide a printer having a printing element operatively associated with a shaped carton holding platen in such a manner as to apply an even printing pressure over the surface of a carton to be printed as it is held in a printing position on the platen.

A further object of this invention is to provide a printer having cyclically operable power means for effecting movement of a printing element from a retracted inking position to a printing position and back to a retracted inking position.

Another object of the invention is to provide a method for printing preformed cartons through which the information to be printed on the carton can be quickly changed.

SUMMARY OF THE INVENTION

The method of the invention comprises the steps of supporting that portion of a preformed carton onto which information is to be printed on a platen means conforming to a portion of the inside shape of the carton, moving a printing element to an inking position, and subsequently moving the printing element from the inking position to a printing position in which the information carried by the printing element is in contact with that portion of the carton supported by the platen whereby the ink carried by the information on the printing element is applied to the preformed carton. The relative position between the printing element and the preformed carton is properly maintained so that the contact between the preformed carton and the information carrying the ink on the printing element is uniform.

The apparatus of the invention comprises generally a printer and a driving means therefor carried by a base member. The printer includes a main supporting framework having a platen thereon complementary in shape to a portion of the inside of a preformed carton to be printed, a printing means pivotally carried by the support framework, an inking means for inking the information on the printing means, and driving means for moving the printing means from an inking position forwardly to a printing position in which the ink carried by the information on the printing means is transferred to the preformed carton.

These and other features, objects and advantages of the invention disclosed herein will become more clearly understood upon consideration of the following detailed description and accompanying drawings wherein like characters of reference designate corresponding parts throughout the several views and in which:

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side-front perspective view of the printer; FIG. 2 is a vertical sectional view of the printer taken substantially longitudinally through the center of the printer;

FIG. 3 is a perspective view similar to FIG. 1, but drawn on a smaller scale and showing the driving means for the printer;

FIG. 4 is an enlarged fragmentary view showing the connection between the power means and one end of the operating link for driving the printer, with certain parts broken away and shown in section for purposes of clarity; and,

FIG. 5 is a fragmentary exploded perspective view of the back-up plate and the releaseably secured character bearing printing element, with certain parts being omitted for purposes of clarity.

DETAILED DESCRIPTION OF ILLUSTRATIVE EMBODIMENTS

These figures and the following detail description disclose specific embodiments of the invention, however, it is to be understood that the inventive concept is not limited thereto since it may be embodied in other forms. The printer PR includes generally a support

means S, a printing means P, and an inking means I, as seen in FIGS. 1 and 2.

Referring now to the drawings, the apparatus of the invention will be described first, and includes generally a printer PR and a driving means D as best seen in FIG. 3.

As shown in FIGS. 1 and 2, the support means S includes a pair of vertically oriented, spaced parallel fore and aft side frames 10, each having an inwardly directed, horizontally oriented support flange 11 extending along the length thereof. A platform 12 having a generally rectangular configuration is supported on flanges 11 and attached thereto to position the side frames 10 in their spaced apart relationship. A carton C shown in dashed lines in FIG. 1 and 2 and in solid lines in FIG. 3 is carried on the platform 12 as described hereinafter for the printing thereof by the printing means P. The printing means P is centrally mounted between the side frames 10 transversely to the longitudinal centerline of the printer.

The printing means P includes generally a substantially flat rectangular back-up plate 14 having upwardly turned lips 15 at each end thereof. The length of back-up plate 14 is slightly less than the distance between the spaced apart side frames 10, and the lips 15 are pivoted on an appropriate bracket portion 16 of the side frames 10 through a parallelogram linkage L. The linkage L includes a first pair of positioning links 18 connecting the forward ends, as seen in FIG. 1 of the lips 15 with the forward ends of the bracket portions 16. A second pair of positioning links 19 connect the rear end of the lips 15 with the rear end of the bracket portions 16 as seen in FIG. 1. Each of the links 18 and 19 are pinned at 20 to the lips 15 and pinned at 21 to the bracket portion 16.

The positioning links 18 and 19 are equal in length so as to maintain the bottom surface of back-up plate of 14 parallel to the platform 12 at all times regardless of the position of the back-up plate 14. The first positioning links 18 have an offset 22 therein to insure free movement of the back-up plate 14 as will be described hereinafter. A spacer 24 is positioned between each of the second positioning links 19 and the bracket portion 16 to also insure free movement of the back-up plate 14 as set forth hereinafter.

A pair of driving links 25 centrally located between the positioning links 18 and 19 connect the central portion of the lips 15 with the center of the bracket portions 16 as seen in FIGS. 1 and 2. The driving links 25 are pinned to the lips 15 at 26 through spacers 27 and to the bracket portions 16 at 28 so as to prevent interference between links 18 and 19 and the links 25. The driving links 25 have upwardly and inwardly directed extensions 29 with a driving rod 54 for connection to driving means D and a handle 30 rotatably connected between the upper ends thereof for manually moving the links 25 and back-up plate 14.

The driving links 25 are also parallel to the positioning links 18 and 19 so that the back-up plate 14 can be moved, it being noted that the pins 26 and 28 are positioned above the planes of pins 20 and 21 so that any inaccuracy in the assembly of the device will render the printing means P inoperative. This serves to insure that the pressure exerted through the driving links 25 will always be equally distributed over the back-up plate 14 since the force exerted on the back-up plate 14 through the links 25 is through the center thereof and the posi-

tioning links 18 and 19 cause the same to be equally distributed over the back-up plate 14. It will be seen that offsets 22 in the links 18 and the spacer 24 associated with the links 19 are sufficient to move the links 18 and 19 out of interference with the driving links 25 in conjunction with the spacer 27 through which the driving links 25 are pinned at 26 to the lips 15. Thus, the bracket portion 16, the links 18, 19, and 25, and the lips 15 define a parallelogram for linkage system. The back-up plate 14 may be moved rearwardly as seen in FIG. 1 to an inking position and forwardly as seen in FIG. 1 to a printing position.

To properly position the cartons C under the back-up plate 14 when moved to a printing position, a platen 31 is provided which is releaseably secured to platform 12 in proper alignment with the back-up plate 14 when it is in printing position. The platen 31 is shaped to conform to the inside of that portion of the carton which is to be printed, here shown with projections and recesses adapted to conform to the inside surface of the cover of an egg carton C. Different shaped platens 31 may be used to replace the platen 31 shown for different shaped cartons C.

A printing element 32 having raised characters 34 thereon printing the carton C is releaseably carried by a backup plate 14 therebelow. The printing element 32 is releaseably attached to backup plate 14 by a catch member 35 as best seen in FIG. 5 having a fixed clip 36 at one side thereof that extends over the backup plate 14 and a flexible clip 38 at the other side thereof that allows the printing element 32 to be releaseably clipped on to the bottom of backup plate 14.

For reinking the characters 34 on the printing element 32 when the backup plate 14 is moved to its inking position, the inking means I includes an ink pad 39 which extends between side frames 10 and which is supported on flanges 40 extending inwardly from the side frames 10. Each flange 40 has an upwardly turned lip 41 at each end thereof to prevent movement of the ink pad 39 longitudinally with respect to the printer. When the backup plate 14 is in its inking position, the characters 34 rest on the ink pad 39 and are reinked for the next printing operation. A cover 42 carried by a pivot pin extending between side frames 10 as indicated at 44 is provided so that the cover 42 can be moved to a closed position to cover the ink pad 39 or moved to an open position during the operation of the printer. This prevents the ink in the ink pad 39 from drying up during periods of non-use. Therefore, it will be seen that when a carton C is placed on the platen 31 and the printing means P is moved from its inking position to its printing position, the characters 34 on the printing element will print the carton C.

Referring now to FIGS. 3 and 4, a driving means D is shown in combination with the printer PR illustrated in FIGS. 1 and 2 with the printer and driving means D mounted on a common base B. The driving means D includes a cyclically operable electrical motor 50 having a rotatable crank 51. Crank element 51 is connected to the printer by means of a yieldable connection 52, link 53 and rod connection 54. The yieldable connection 52 includes nut and bolt connecting means 55 pivotally connecting link 53 to a slidable block 56. Block 56 is slidably supported within slot 57 on a pair of stabilizing rods 58, 59, and carried by a center rod 60 for yielding movement against a compression spring

61. The center rod 60 is reciprocally carried in an appropriate hole (not shown) in crank 51.

The slot 57 is formed by an inverted substantially U-shaped bracket 62 connected to crank 51 by means of a pair of threaded members 63, 64, being threaded into complementary threaded members 65, 66 in crank 51. Supported on an opposite end of crank 51 is a counter balance weight means 67 as seen in FIG. 3, detailed in design to provide a balance condition of crank 51.

The control motor 50 is effected by means of a conventional electrical circuit (not shown) which includes a power switch SW-1 and a switch SW-2 operatively associated with the motor circuit and the platen 31 for operation by a carton C being placed in position on the platen 31. Closing of switch SW-2 will effect one cycle of rotation of crank 51 to move the element 32 with the characters 34 thereon from an intermediate position as shown in FIGS. 1-3 back to a retracted inking position whereby the characters 34 are inked by contact with ink pad 39, then forward to a printing position in which the characters 34 are in contact with the carton C to deposit the ink on the carton and then back to the intermediate position shown in FIG. 3. Therefore, it will be seen that all the operator has to do is to place a carton C on the platen 31 and the printing is effected. This is because the Carton C closes switch SW-2 when the carton C is properly positioned on the platen 31. An appropriate cut out 49 is provided in the platform 12 to facilitate the positioning of the carton C on the platen 31.

OPERATION

In operation, it will be seen that the main power switch SW-1 is turned on, and the cover 42 opened so that the ink pad 39 is exposed. The operator then places the carton C on the platen 31 to close switch SW-2 and activate motor 50 for one revolution. As the motor rotates the crank 51 in the direction shown by the arrows 70, the printing means P is first moved rearwardly so that the characters 34 on the printing element 32 contact the ink pad 39 to pick up ink. As the crank 51 continues to rotate as shown by the arrows 70, the printing element 14 is moved forwardly into contact with that portion of the carton C carried by the platen 31. The characters 34 contact the carton C and deposit the ink therefrom onto the carton. The throw of crank 51 is such that the characters 34 contact the carton C before the full stroke of the printing means C has been realized. The reactive force generated by the carton C on the printing means P causes the block 56 to be retracted against spring 61 so that the desired pressure between the printing element 32 and the carton C is achieved. Since the cartons C vary somewhat in their thicknesses, the spring 61 insures that the proper pressure will be exerted on the carton C by the printing element 32 to properly print same. As the crank 51 continues to rotate to its position shown in FIG. 3, it retracts the printing means to its intermediate position whereby the carton C with the printing thereon can be removed and another carton C placed on the platen 31 for printing.

The method on the invention, then, comprises the steps of supporting a preformed carton on a platen having an external configuration corresponding to the internal configuration of that portion of the carton to be printed in a predetermined position, positioning a printing element having a desired characters thereon

above and parallel to the carton positioned on the platen, positioning an inking means in substantially the same plane as that portion of the car on C to be printed and spaced therefrom, moving the printing element to an inking position in which the characters on the printing element are in contact with the inking means, then moving at the printing element with the ink on the characters over and into contact with that portion of the carton to be printed while maintaining the orientation of the printing element such that the characters carrying the ink thereof are properly positioned with respect to the carton, pressing the characters carrying the ink against that portion of the carton which is to be printed with sufficient pressure to transfer the ink from the characters on to the carton while maintaining the contact pressure uniformly over the entire area to be printed, and subsequently retracting the printing element from contact with the carton for removal of the printed carton from the platen means.

It is to be understood that modifications, substitutions and equivalents may be used without departing from the scope or spirit of the invention described herein.

We claim:

1. A printer for use in printing information on a preformed carton comprising, in combination:

- a. a base support framework;
- b. a shaped platen support means mounted on said support framework for supporting a preformed carton in a position for receiving printed information;
- c. a printing means mounted on said framework for movement from a retracted position to a pressure printing position against said platen and including information to be printed;
- d. means provided on said printer for inking the surface of said printing means when in said retracted position;
- e. cyclical power means including rotatable crank means operatively associated with said printing means and information for moving the same from said retracted position to said pressure printing position against said platen, whereby information contained on said printing means will be transferred to a carton supported on said shaped platen;
- f. yieldable connecting means mounted for rotation by said power means for allowing pressure yielding of said printing means in response to contacting said inking means or a carton in a printing position on said platen; said yieldable connecting means comprising:

1. a connecting link to said printing means,
2. a slidable block pivotally connected to said link,
3. a center rod for slidably mounting said block,
4. a compression spring disposed around said center rod to impart yieldable movement to said block,
5. a U-shaped member fixed to one end of said crank means, said center rod being centrally located between the legs of said U, the cross bar of said U serving as one stop for said block and the end of the crank means acting with said spring serving as the other stop; and,

g. counter balance means associated with said yieldable connecting means, said counter balance being located at the end of said crank opposite said connecting means.

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2. A printer as described in claim 1 further characterized in that said shaped platen is detailed in shape to be complementary to an inside surface of said preformed carton.

3. A printer as described in claim 2 further characterized in that said preformed carton includes a series of cavity portions and said shaped platen includes a series of projections complementary in number and shape to

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said cavity portions.

4. A printer as described in claim 3 further characterized in that said printing means includes a removable information bearing plate element provided with releasable latch means for releasably securing said information bearing plate element to said printing plate.

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