July 26, 1938. E. C. NISSEN 2,124,792

BASKET PRINTING MACHINE

Filed June 8, 1936 4 Sheets-Sheet 1

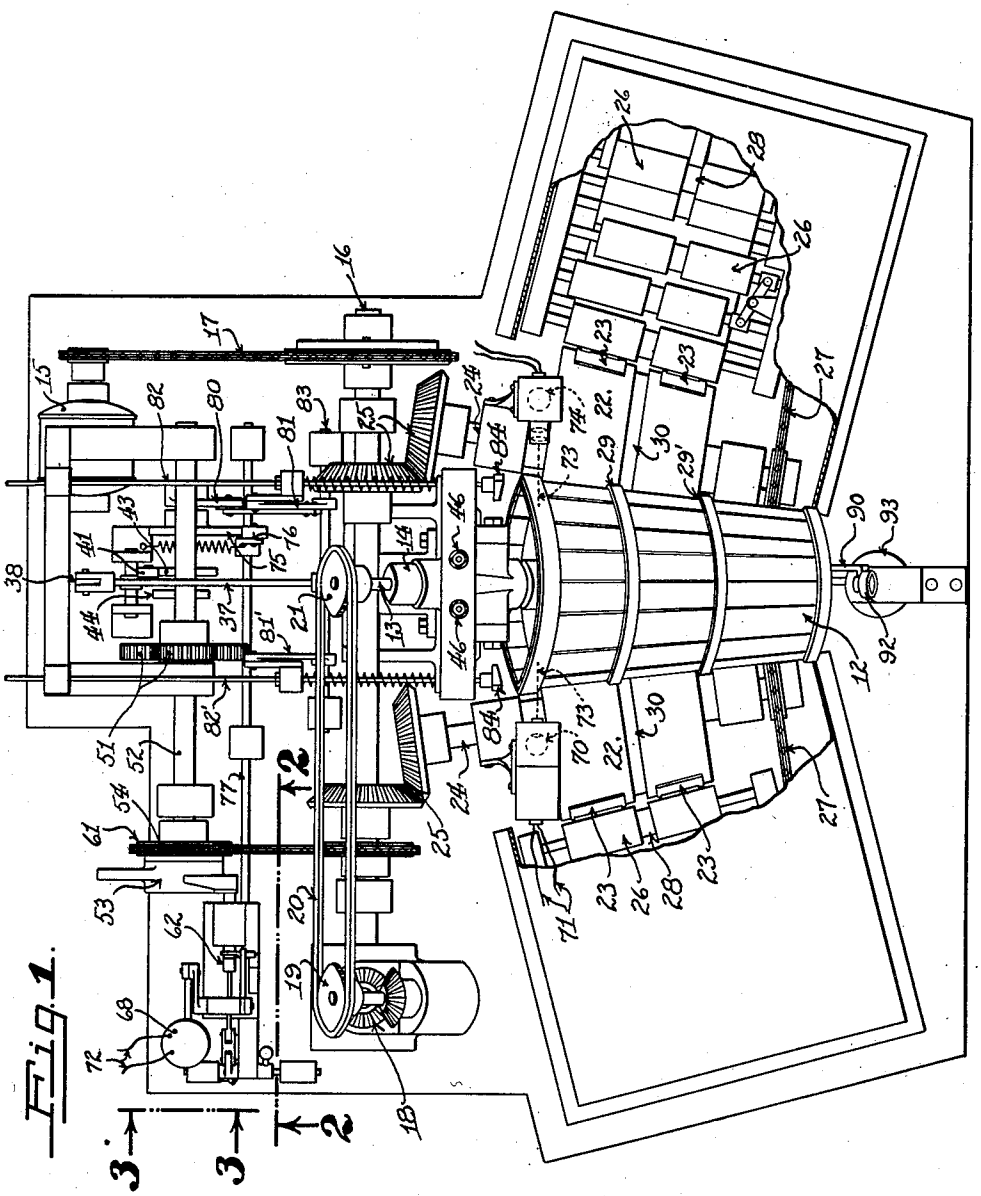


Fig. 1.

INVENTOR,
Emil Carl Nissen
BY
Booth & Booth
ATTORNEY.

July 26, 1938. E. C. NISSEN 2,124,792

BASKET PRINTING MACHINE

Filed June 8, 1936 4 Sheets-Sheet 2

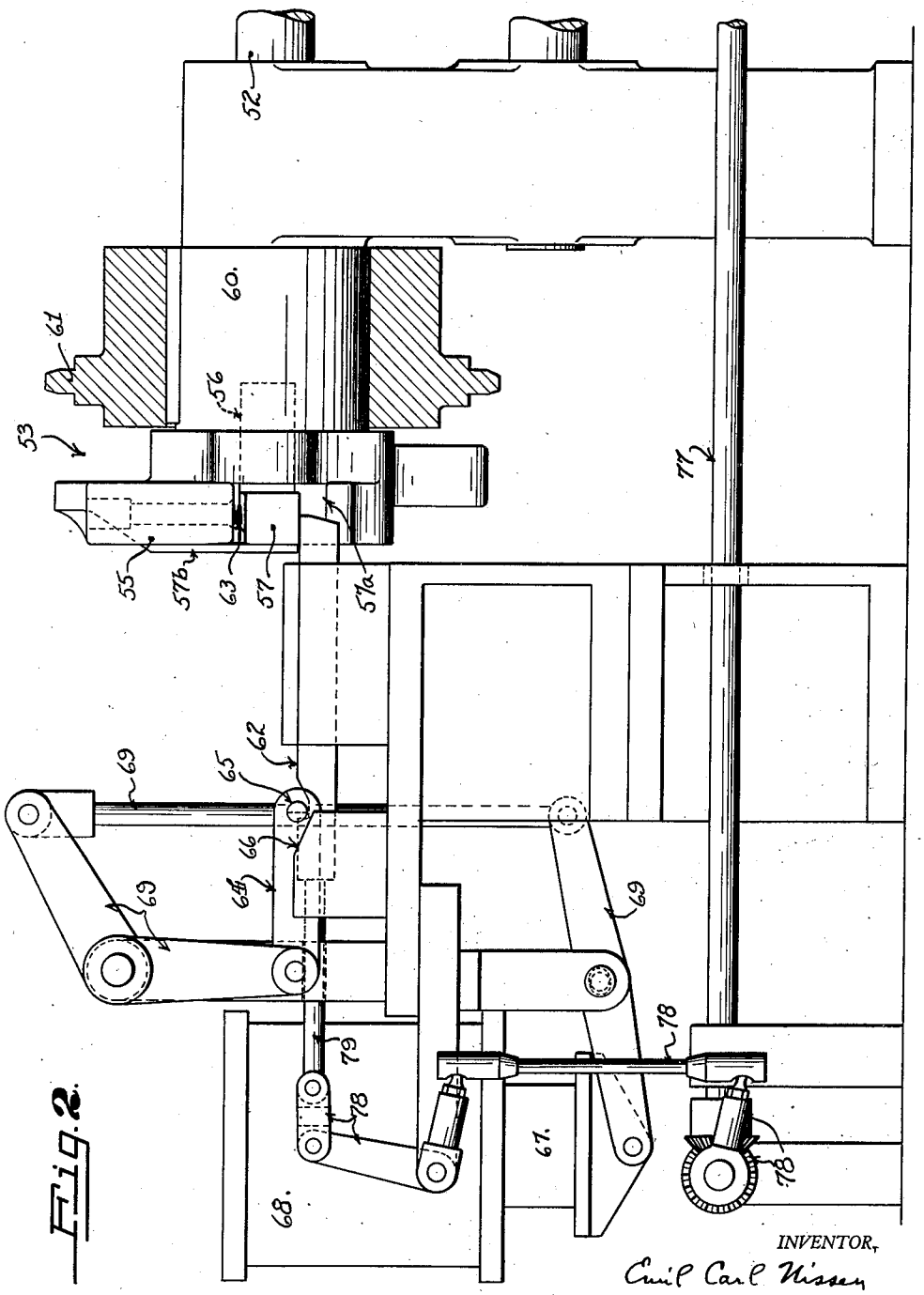


Fig. 2.

INVENTOR,
Emil Carl Nissen

BY Booth & Booth

ATTORNEY.

July 26, 1938. E. C. NISSEN 2,124,792

BASKET PRINTING MACHINE

Filed June 8, 1936 4 Sheets-Sheet 3

Fig. 4.

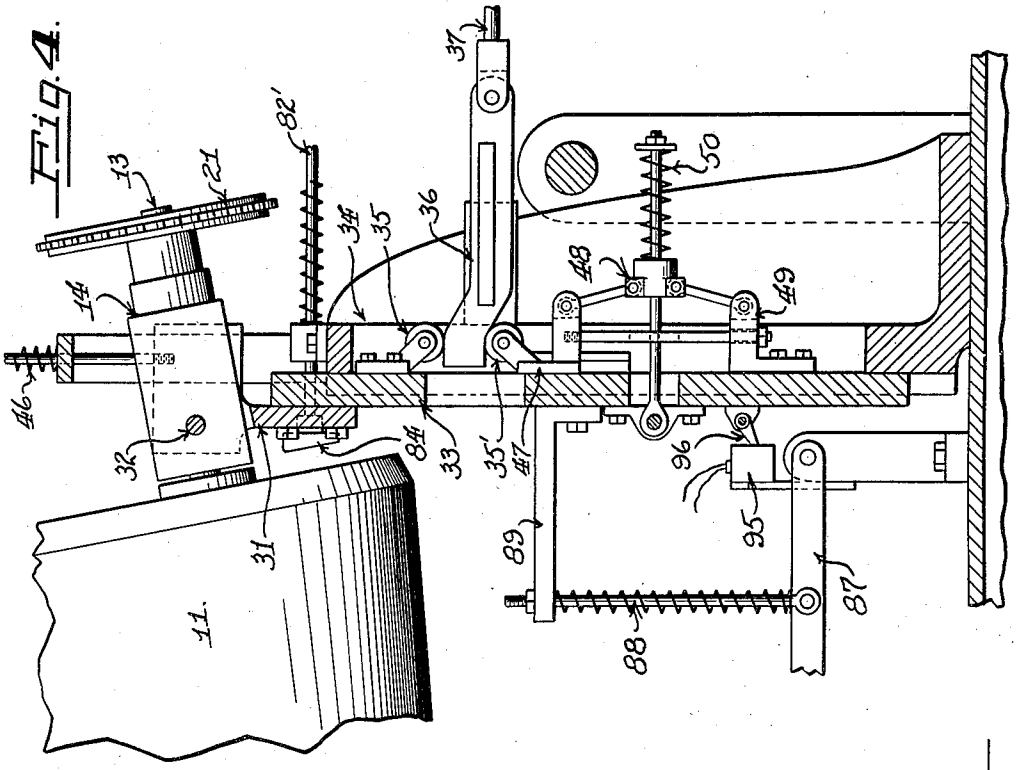
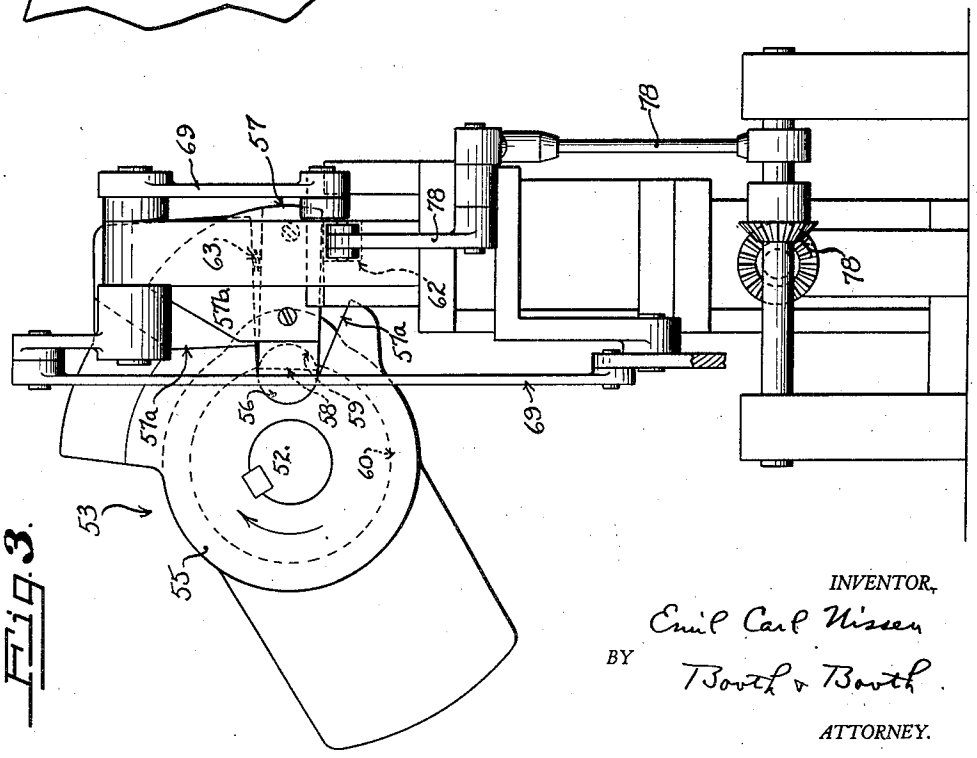


Fig. 3.



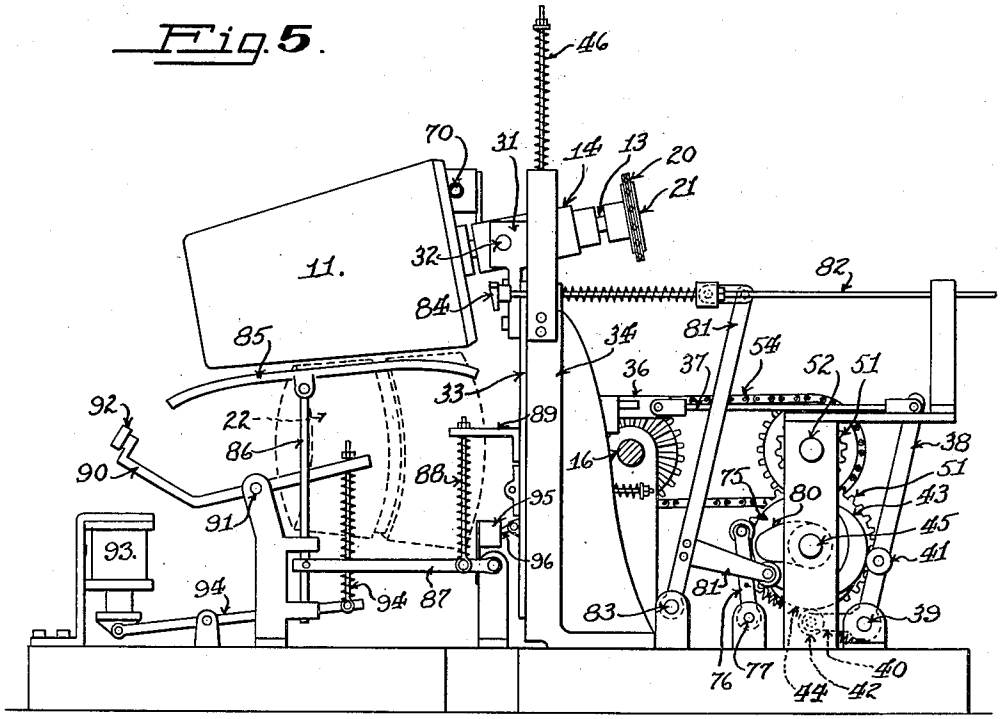
INVENTOR,
Emil Carl Nissen
BY
Booth & Booth
ATTORNEY.

July 26, 1938. E. C. NISSEN 2,124,792

BASKET PRINTING MACHINE

Filed June 8, 1936 4 Sheets-Sheet 4

Fig. 5.



INVENTOR,

Emil Carl Nissen

BY

Booth & Booth

ATTORNEY.

Patented July 26, 1938 2,124,792

UNITED STATES PATENT OFFICE

2,124,792

BASKET PRINTING MACHINE

Emil Carl Nissen, San Francisco, Calif.

Application June 8, 1936, Serial No. 84,061

3 Claims. (Cl. 101—38)

The present invention relates to apparatus for printing or branding the exterior surfaces of conical or cylindrical containers.

The embodiment of the invention illustrated and described herein is a machine designed for printing suitable legends or designs upon tapered or conical veneer baskets of the type used in the packing and marketing of vegetables and fruits. It will be obvious, however, that the machine can be adapted without material change to the printing or branding of other containers, and it is also to be understood that the form, proportion, and arrangement of the several parts herein described can be varied, within the limits of the claims hereto appended, without departing from the spirit of the invention.

The principal object of the invention is to provide a machine, semi-automatic in operation, which is capable of printing in at least four different colors simultaneously upon the outside of a container. Another object is to provide a machine in which the operating cycle is started by the mere act, on the part of the operator, of placing a container in the proper position, and in which the printing operation is automatically carried to completion and the container automatically ejected from the machine without further control on the part of the operator. Other objects and advantages of the invention will become apparent from the following specification.

Reference will be made to the accompanying drawings, in which

Fig. 1 is a plan view of the machine with portions of the housing enclosing the inking mechanism broken away.

Figs. 2 and 3 are vertical sections taken on the lines 2—2 and 3—3 of Fig. 1 respectively and enlarged.

Fig. 4 is an enlarged vertical section of the structure upon which the container holding mandrel or platen is mounted, and by which it is moved into and out of contact with the printing rolls.

Fig. 5 is a part sectional end elevation of the machine as seen from the right of Fig. 1, the printing and inking mechanism being omitted in order to show the parts which lie directly below the platen.

In the drawings, the reference numeral 11 designates a mandrel or platen adapted to hold the container to be printed. In the present machine, the platen 11 is in the form of a truncated cone upon which may be placed the basket to be printed, as shown at 12 in Fig. 1. The platen 11 is carried upon one end of a shaft 13, journaled in a bearing 14 and continuously rotated by any suitable mechanism. As a preferred example of such mechanism, I have shown an electric motor 15 driving a horizontal shaft 16 through a chain 17. Power is transmitted from the shaft 16 through suitable gearing indicated at 18 to a sprocket 19, and thence through a chain, indicated at 20, to a sprocket 21 on the end of the platen shaft 13.

The printing is accomplished by means of rolls 22 whose surfaces are provided with any suitable means, well known in the art, which it is not necessary to illustrate herein, for holding type or impression plates indicated at 23. The printing rolls 22 are carried upon shafts 24 and are continuously rotated by bevel gears 25 from the main driving shaft 16.

There are two printing roll shafts 24, as shown in Fig. 1, with the platen 11 positioned above and between them in such relation as to cause the impression members 23 to make contact with the outside of the basket 12 during the rotation of the latter. Inasmuch as the contact between the printing members and the basket must be a true rolling contact in order to make a clear and sharp impression, the printing rolls in the present machine must be conical, their shafts 24 and the platen shaft 13 must be properly related as to both position and direction, and the power transmitting gearing must be so proportioned as to cause said shafts 13 and 24 to rotate at the proper relative speed, i. e. so that there shall be no slip between the surfaces of the impression members and the surface of the basket.

Any suitable and well known means, indicated as a plurality of rolls 26, is provided for inking each printing roll 22. There are two sets of inking rolls 26, as shown, one for supplying ink to each of the printing rolls 22. The inking mechanisms are preferably driven by chains, indicated at 27, from the outer ends of the printing roll shafts 24.

The inking rolls of each mechanism are divided into two parts transversely, as indicated at 28, so that each half of said rolls may be supplied with ink of a different color. By this construction, each printing roll 22 may be made to print in two colors, the impression member carried upon its outer end printing in one color, and the member at its inner end printing in a different color. By properly positioning the impression members of one roll 22 with respect to those of the other roll, the machine can be made to print in four colors simultaneously. For ex-

ample, during one half of a revolution of the basket 12, the right hand roll 22 will print upon one half of said basket in two colors, and during the other half revolution the other half of said basket will be printed by the left hand roll 22 in two other colors. Obviously, the inking rolls 26 can be divided into more sections if desired, in order to print in a still larger number of different colors.

In the machine as illustrated, the basket 12, which is of a common and widely used form, has two intermediate exterior hoops 29 and 29', and the printing rolls are so positioned as to print above and below the uppermost of said intermediate hoops. The rolls 22 are preferably provided with grooves 30 to provide for the hoop 29, and to further ensure separation of the different colors.

The platen 11 is lowered and raised bodily to bring the exterior of the basket into and out of contact with the printing rolls 22. This movement of the platen is accomplished automatically and is so timed that the platen makes no more than one revolution during the time that the basket is in contact with the printing rolls. The act of placing the basket upon the mandrel, which is done manually by the operator, sets in motion certain mechanism to be described presently, which lowers the platen and its basket into contact with the printing rolls, and which after one revolution of said platen again raises it and ejects the basket from it.

The bearing 14 of the platen shaft 13 is mounted upon a bracket 31, Fig. 4, preferably by means of an adjustable pivotal connection 32 through which the angular position of the platen can be adjusted to provide proper contact with the printing rolls throughout the length of the basket. The bracket 31 is secured upon the upper end of a vertical slidable plate 33 which is mounted in suitable guides on an upstanding frame member 34. The plate 33 carries a roller 35 which rests upon the top of a horizontally slidable cam bar 36. The cam bar 36 is connected by a link 37 with a lever 38, Fig. 5, which is pivoted at 39 and has a horizontal extension 40. Rollers 41 and 42 are carried respectively by the lever 38 and its arm 40, and are positioned to follow two adjacent cams respectively numbered 43 and 44, secured upon a horizontal shaft 45. Rotation of the shaft 45, therefore, slides the cam bar 36 in and out, and causes the lowering and raising of the plate 33 and the platen 11. Springs 46 partially counterbalance the weight of the plate 33 and platen 11.

The plate 33 carries a second roller 35' bearing against the bottom of the sliding cam bar 36, Fig. 4. The roller 35' is mounted upon a bracket 47, which is slidable upon the plate 33 and is pressed upwardly to hold the roller 35' in yielding contact with the bottom of the cam bar 36, by means of a toggle member 48 connecting said bracket 47 with a lower bracket 49 secured upon the plate 33. A spring 50 actuates the toggle 48. By means of this construction, the basket is yieldably pressed down against the printing rolls 22 when the cam bar 36 is moved inwardly, i. e. toward the left in Fig. 4.

The shaft 45 is driven through gearing 51, Fig. 1, from an upper horizontal shaft 52, which in turn is driven through a clutch mechanism 53 and a chain 54 from the main drive shaft 16. The clutch mechanism 53, as shown in Figs. 2 and 3, comprises a head 55 keyed upon the end of the shaft 52, and provided with an oscillating off-set pin 56, which has an arm 57 secured to, and extending laterally from its outer end. The inner end of said pin is flattened on one side, as shown at 58, Fig. 3, and is positioned to engage a shoulder 59 formed upon the forward end of the hub 60 of a sprocket 61, Fig. 2, said hub being rotatably mounted upon the shaft 52. When the pin 56 is in the position shown in Fig. 3, its flattened inner end will not engage the hub of the sprocket 61, and said sprocket will therefore rotate freely upon the shaft 52 without turning the latter. The arm 57 operates in an approximately V-shaped recess 57a in the head 55, and carries a guard plate 57b which covers a portion of said recess.

The clutch pin 56 is held in this released position by a slidable bar 62, Figs. 2 and 3, whose inner end engages the arm 57 of said pin. When the bar 62 is drawn outwardly to free said arm 57, the latter is moved downwardly by a spring 63, thereby turning the pin 56 sufficiently to cause its inner flattened end to be engaged by the shoulder 59 of the sprocket hub 60. The clutch head 55 and the shaft 52 upon which it is keyed thereupon rotate with the sprocket 61 until the bar 62 is again moved inwardly and engages the arm 57, whereupon the pin 56 is again turned to its releasing position.

The bar 62 is drawn outwardly to cause the clutch 53 to engage by a link 64 which carries a pin 65 positioned to engage a notch in the bar 62, as shown in Fig. 2. A stationary inclined block 66 raises the pin 65 out of engagement with the notch of the bar 62 at the end of the outward movement of said bar. The link 64 is actuated by the armature core 67 of a solenoid 68 through a lever and link system 69. The solenoid 68 is energized by current supplied from any suitable source, not shown, and controlled by a photo-electric cell indicated at 70 in Fig. 1, it being understood that the wires 71 leading from the photo-electric cell and the wires 72 of the solenoid 68 are connected in an electric circuit with the source of current in any suitable and well known manner which need not be described and illustrated herein.

The photo-electric cell 70 is activated by a beam of light whose path is indicated by the dotted line 73, and which is projected from a source of light 74 in such a manner as to be intercepted by the basket 12 when the latter is placed in operative position upon the platen 11. The control circuit is so arranged that when there is no basket upon the platen, and the photo-electric cell is activated by the beam of light, the solenoid 68 remains inoperative, but when said beam is intercepted by the placing of a basket in operative position upon the platen, the solenoid is energized, which causes the clutch 53 to engage and the platen to be moved down to bring the basket into contact with the printing rolls 22.

The clutch 53 is released by the following mechanism. A third cam 75, Figs. 1 and 5, on the shaft 45, actuates an arm 76 on a horizontal rock shaft 77, which is connected through a system of gears, levers and links 78, Fig. 2, with a pusher bar 79, the latter abutting against the end of the clutch actuating bar 62 to push it inwardly. The cam 75 is so formed and mounted as to move the bars 79 and 62 inwardly before the clutch and the shaft 52 have completed two revolutions, so that the clutch operating arm 57, after having been released by the withdrawal

of the bar 62, is again engaged by said bar at the end of its second revolution.

The platen thus makes two revolutions between the first engagement of the clutch and its final release. During the first half revolution, the platen and basket are being moved downwardly into printing contact with the rolls 22. This printing contact continues during one revolution of the basket. Then during the final half revolution, the platen is returned to its upper position and the basket is thrown off. It is to be noted that the clutch is engaged, to start the printing cycle, by the positioning of the basket upon the platen, but that said cycle is automatically stopped at the end of a predetermined extent of rotary movement, viz: two revolutions of the platen. The two-to-one ratio between the revolution of the platen and the revoltion of the cycle-operating cam shaft 45 is obtained in the gearing 51.

The platen is raised away from the printing rolls by the cam bar 36. Toward the end of this raising movement, a fourth cam 80 on the cam shaft 45 (Figs. 1 and 5) actuates a bell-crank lever 81 whose upper end is connected with an ejector rod 82. The lever 81 is fixed upon a horizontal rock shaft 83, upon which is mounted another lever 81', the upper end of the latter being connected with a second ejector rod 82'. The rods 82 and 82' have presser feet 84 upon their ends, which abut against the rim of the basket to push it off the platen. This ejecting operation occurs as the platen is being raised, just before the cam shaft completes its revolution and comes to rest.

A guide is provided to prevent the basket from coming into contact with the printing rolls while it is being placed upon the platen and ejected therefrom. This guide comprises a plate 85, Fig. 5, positioned beneath the platen and between the two printing rolls. Said guide is mounted upon a vertically slidable rod 86, which is raised and lowered by a lever 87 connected by a link and cushioning spring 88 with a bracket 89 secured to the plate 33 which supports the platen. In Fig. 5 the platen and guide are shown in their upper positions, said platen being out of contact with the printing rolls. When the basket is being placed upon the platen, it slides over and rests temporarily upon the guide 85 until it is in final position upon said platen. Then when the platen descends, to bring the basket into contact with the printing rolls, the guide 85 also descends, but through a greater distance due to the leverage of the arm 87, so that during the printing cycle said guide is entirely clear of the basket. When the platen rises again, the guide also rises to its first position, to prevent the basket from dropping on to the printing rolls when it is pushed off the platen by the ejectors 84.

Means are also provided for holding the basket on the platen during the printing operation. This consists of an arm 90, Fig. 5, pivoted at 91, and provided with a roller 92 at its outer end, which swings up into contact with the bottom of the basket after the latter has been placed on the platen 11. The arm 90 is operated by a solenoid 93 through a lever and link connection 94. The solenoid is controlled by a switch indicated at 95, Figs. 4 and 5, which is operated by a trigger 96 extending from the sliding platen supporting plate 33. The electric circuit connecting the solenoid, the switch, and a suitable source of current, is a detail within the knowledge of any skilled mechanic, and therefore has been omitted from the drawings. The switch 95 and trigger 96 are so connected that when the plate 33 descends to bring the basket into contact with the printing rolls, the solenoid 93 is energized, thereby moving the roller 92 up into firm contact with the bottom of the basket to hold the latter in position on the platen 11. When the plate 33 rises again at the end of the printing operation, the solenoid 93 is de-energized, allowing the arm 90 to drop to its inoperative position (as shown), so that the roller is out of the way during the removal of the basket from the platen and the placing of another basket thereon.

In reviewing the operation of the above described machine, let it be assumed that the several divisions of the inking mechanism are supplied with the desired colored inks, and that the type or impression plates have been affixed upon the printing rolls 22 in proper relative positions. The platen 11 and the printing rolls 22 are rotating continuously in synchronized relation, but said platen is elevated out of contact with said rolls.

The operator places a basket endwise upon the platen, sliding it over and upon the guide 85 until it fits snugly upon the platen and is rotated thereby. The end of the basket intercepts the beam of light which has been activating the photo-electric cell 70, with the result that the control mechanism causes the clutch 53 to engage and start the cam shaft 45 rotating. The cam bar 36 is moved inwardly, lowering the plate 33 and the platen 11 until the basket comes into contact with the printing rolls. At the same time, the guide 85 moves downwardly out of the way of the basket, and the holder arm 90 moves up until its roller 92 presses against the end or bottom of said basket to hold it tight upon the platen.

After one revolution of the basket, during which it is printed, the plate 33 and platen 11 are again elevated to move said basket out of contact with the printing rolls. At the same time, the guide 85 is returned to its functional position, and the holder arm 90 is retracted. The ejector rods 82 and 82' are then moved forward, pushing the basket off the platen, and the clutch 53 is released by the final movement of the cam shaft 45, which thereupon comes to rest. The operator catches the printed basket, which is loosely resting on the guide 85, removes it, and places another basket upon the platen, whereupon the cycle is repeated.

I claim:

1. A container printing machine comprising a rotatable member for holding the container, a rotatable printing member, means for moving one of said members toward and away from the other to bring the container into and out of rolling contact with the printing member, means movable into and out of contact with the container to secure it in position upon the holding member, and mechanism for moving said securing means the said mechanism being controlled by approaching and separating movement of said members.

2. A container printing machine comprising a rotatable platen member formed to fit within the container, a rotatable printing member, means for moving one of said members toward the other to establish rolling printing contact between the container and said printing member, and means movable into contact with the container to hold it upon said platen, said holding means being moved in timed relation to the approaching movement of said members.

3. A container printing machine comprising a rotatable platen member formed to fit within the container, said platen having a free end over which the container is placed in position, a rotatable printing member, means for moving one of said members toward the other to establish rolling printing contact between the container and said printing member, a movable guide positioned adjacent said platen for partially supporting and guiding the container while it is being placed over the free end of said platen, and means for moving said guide away from the container during the approaching movement of said platen and printing members.

EMIL CARL NISSEN.