Dec. 30, 1958 V. W. JEZERSKI ET AL 2,866,402

APPARATUS FOR PRINTING CLOSURES ON CONTAINERS

Filed Oct. 2, 1953 4 Sheets-Sheet 1

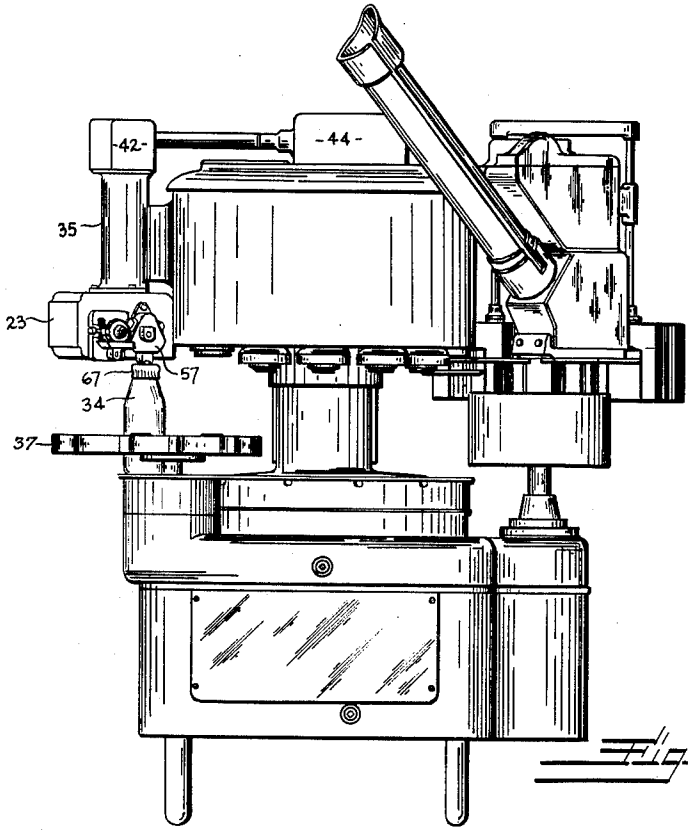


Fig. 1

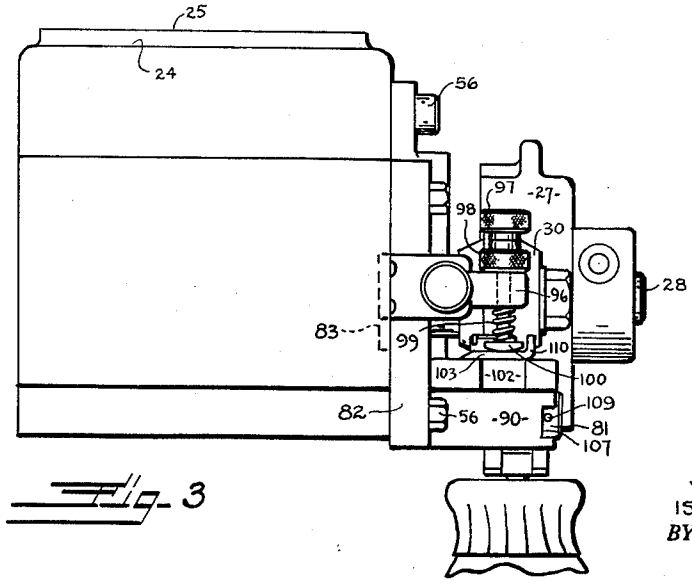


Fig. 3

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APPARATUS FOR PRINTING CLOSURES ON CONTAINERS

Filed Oct. 2, 1953 4 Sheets-Sheet 2

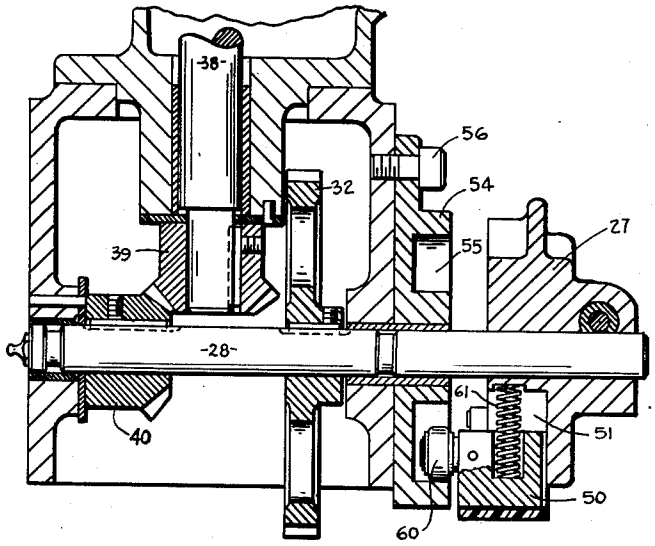


Fig. 5

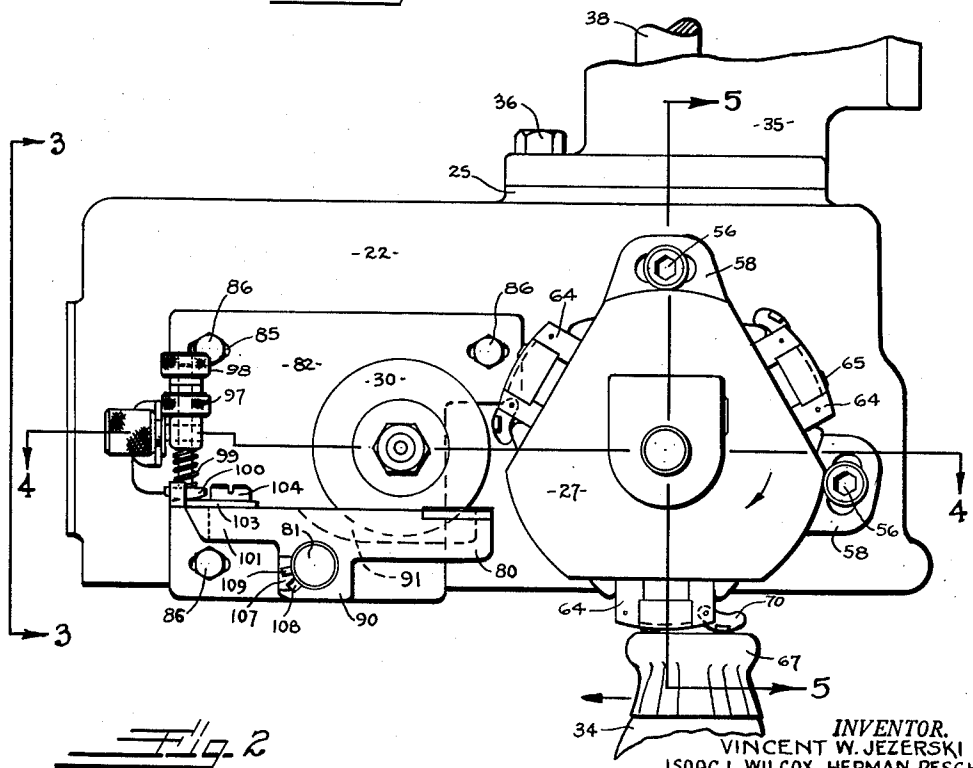


Fig. 2

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APPARATUS FOR PRINTING CLOSURES ON CONTAINERS

Filed Oct. 2, 1953 4 Sheets-Sheet 3

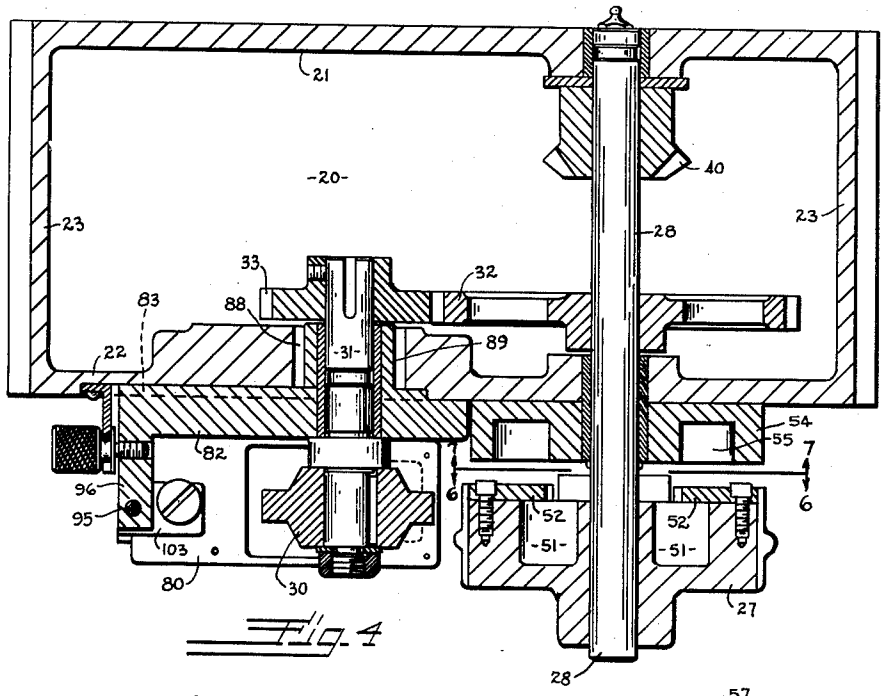


Fig. 4

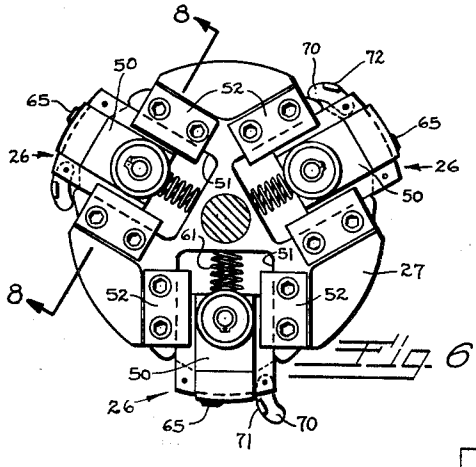


Fig. 6

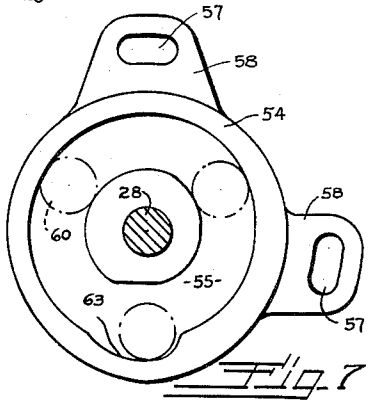


Fig. 7

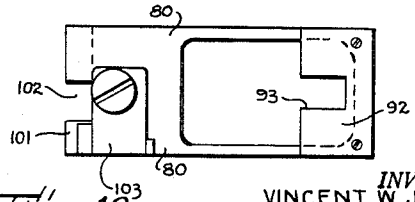


Fig. 16

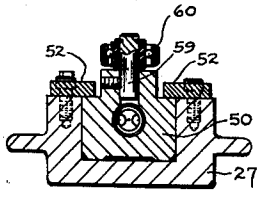


Fig. 8

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APPARATUS FOR PRINTING CLOSURES ON CONTAINERS

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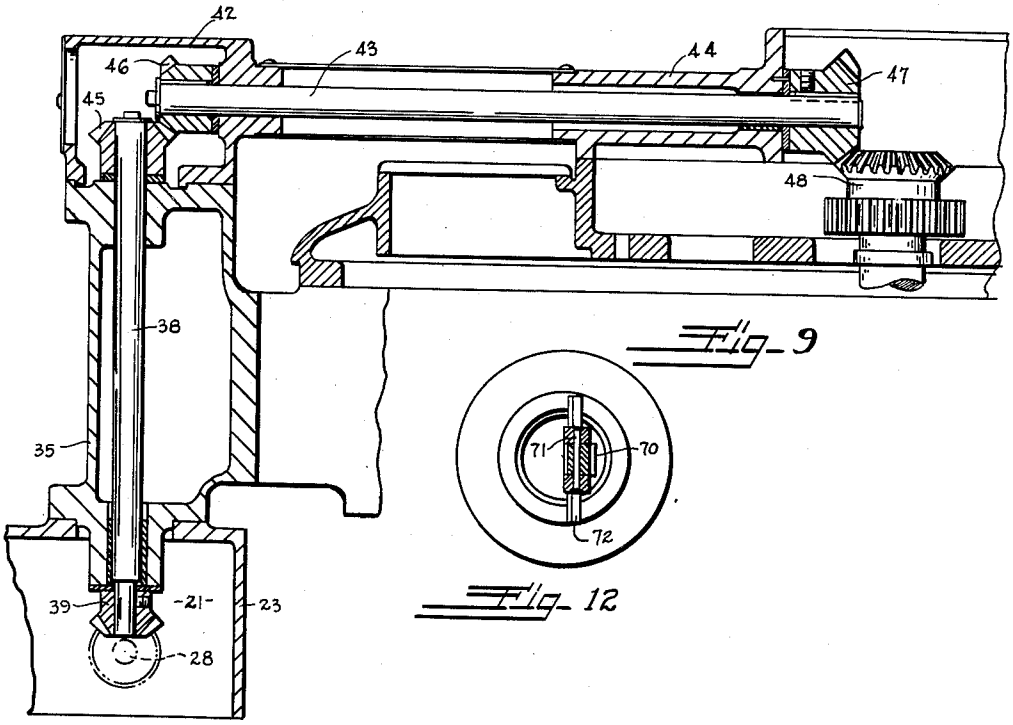


Fig. 9

Fig. 12

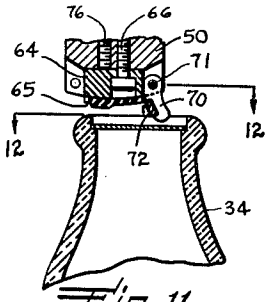


Fig. 11

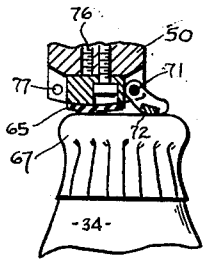


Fig. 10

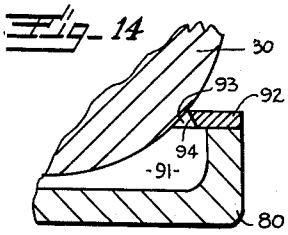


Fig. 14

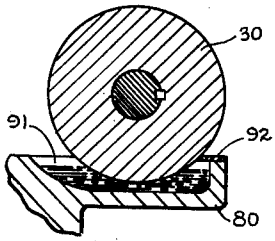


Fig 13

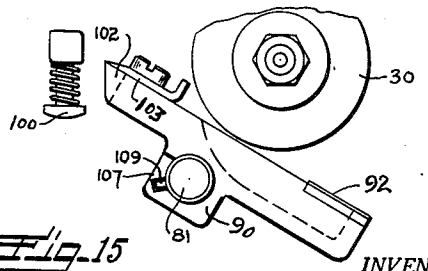


Fig. 15

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2,866,402

APPARATUS FOR PRINTING CLOSURES ON CONTAINERS

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Application October 2, 1953, Serial No. 383,830

3 Claims. (Cl. 101—35)

This invention relates in general to printing apparatus, and more particularly to apparatus for printing closures on an advancing procession of containers.

The apparatus is intended especially for printing indicia on milk bottle closures, or caps, to indicate the day or date the milk is to be offered for sale to the public. Heretofore, it has been conventional practice to print this indicia on the caps when they are formed and printed at the cap manufacturing plant. This arrangement necessitated the dairy carrying in stock a supply of caps for each day of the week, and the additional burden on the part of the operator of making certain that the caps used carried the correct indicia.

This invention has as an object a self-contained printing apparatus embodying a particularly compact structural arrangement whereby the apparatus may be readily applied as a unit to a bottle capping machine, and which functions to efficiently imprint the desired indicia on the cap or closure of each bottle advancing from the capping machine.

The invention has as a further object an apparatus of the type referred to embodying a novel structure which functions in the absence of a closure on a bottle to prevent the printing element from engaging the top of the bottle.

The invention has as a further object an ink pot structure including a doctor blade for the ink furnishing roll, the arrangement being such that the pot can be quickly and conveniently removed from the printing apparatus without the use of any tools, and without disturbing the precise adjustment of the pot and the doctor blade carried thereby in relation to the furnishing roll.

The invention consists in the novel features and in the combinations and constructions hereinafter set forth and claimed.

In describing this invention, reference is had to the accompanying drawings in which like character designate corresponding parts in all the views.

In the drawings—

Figure 1 is a side elevational view of a printing apparatus embodying our invention, the apparatus being mounted upon and operatively connected to a container capping machine.

Figure 2 is an enlarged side elevational view of the printing apparatus.

Figure 3 is an end elevational view of the printing apparatus looking to the right, Figure 2.

Figure 4 is a sectional view taken on line 4—4, Figure 2.

Figure 5 is a sectional view taken on line 5—5, Figure 2.

Figure 6 is a view taken on line 6—6, Figure 4.

Figure 7 is a view taken on line 7—7, Figure 4.

Figure 8 is a view taken on line 8—8, Figure 6.

Figure 9 is a vertical sectional view of the drive structure connecting the printing apparatus with the capping machine.

Figure 10 is a vertical sectional view of one of the printing elements engaging a closure.

Figure 11 is a view, similar to Figure 10, showing the position of the printing element when the container in juxtaposition thereto is not provided with a closure.

Figure 12 is a view taken on a line corresponding to line 12—12, Figure 11.

Figure 13 is an enlarged vertical sectional view of the ink furnishing roll and the contiguous well portion of the ink pot.

Figure 14 is an enlarged view of the lower right hand portion of Figure 13 to better illustrate the doctor blade.

Figure 15 is a side elevational view of the ink pot tilted for removal from its pivot support.

Figure 16 is a plan view of the ink pot, as shown in Figure 15.

The printing apparatus is shown in Figures 1 and 9 as being mounted upon a container or bottle capping machine which may be of the general type shown in Patent No. 2,310,868, issued to J. F. Price, February 9, 1943.

The apparatus consists of a unit comprising a box shaped housing having a bottom wall 20, side walls 21, 22, end walls 23, and a top wall 24 formed adjacent one end of the housing with a pad 25. The closure printing elements, designated generally at 26, are mounted for radial movement in a turret 27 mounted on a shaft 28 journalled horizontally in bearings in the side walls 21, 22, and extending through the side wall 22.

An ink furnishing roll 30 is mounted upon a shaft 31 journalled in a plate 82 mounted on the side wall 22 of the housing. The shafts 28, 31, are connected together by spur gears 32, 33, mounted on the shafts within the housing.

The shaft 28, and accordingly the shaft 31, is rotated in timed relation to the advancement of the containers 34 as they are advanced from the capping machine shown in Figure 1 by the outfeed star wheel 37. The housing is secured to the lower end of a hollow bracket 35, this bracket being attached to the pad 25, as by screws 36. The bracket is attached to the frame of the capping machine and there is a shaft 38 journalled vertically in the bracket and provided at its lower end with a miter gear 39 meshing with a complemental gear 40 mounted on the shaft 28. The upper end of the bracket 35 carries a housing 42 in which one end of a horizontally extending shaft 43 is journalled. The opposite end of the shaft 43 is journalled in a housing 44 attached to the top of the capping machine. The shaft 43 is connected to the shaft 38 through miter gears 45, 46. A miter gear 47 is fixed to the inner end of the shaft 43 and is arranged in mesh with a complemental gear 48 connected to a rotatable shaft or element in the capping machine.

Each printing element consists of a block 50 slidably mounted in a radially extending slot 51 formed in the turret 27, the block being retained in the slot by gibs 52. The slots 51 are formed on the inner side of the turret and there is mounted on the housing wall 22 a cam member 54, the cam member being rotatably adjustable about the axis of the shaft 28 and being formed with an annular cam groove 55 confronting the blocks 50. The cam member 54 is adjustably fixed to the wall 22 of the housing by screws 56 extending through slots 57 extending in a circumferential direction in lugs 58 of the cam member.

Each of the blocks 50 is provided with a pin 59 extending inwardly toward the cam member, and a roller 60 is journalled on each of the pins 59, the rollers being positioned in the cam groove 55. The blocks are yieldingly urged radially outwardly by compression springs 61. The cam groove 55 is of circular form except for a relatively short depression 63 formed at the lower portion of the groove, see Figure 7. The arrangement is such that the blocks 50 are maintained a uniform distance

from the axis of the shaft 28 during rotation of the turret 27 except when the blocks approach their lowermost position whereupon they are urged downwardly by the springs 61 due to the depression or valley 63 formed in the cam track.

The outer end of each of the blocks 50 is formed with a circumferential slot in which there is mounted a block 64 having attached to its face a print type 65, the block 64 being retained in the slot by a screw 66. The cam groove 55 is formed so that as the turret rotates in a clockwise direction Figure 2, the type 65 engage the periphery of the ink furnishing roll 30 and the motion transmitting mechanism, described in connection with Figure 9, causes the printing elements to be successively moved into juxtaposition with the closure 67 on the top of each container 34 as they are advanced from the capping machine. The valley 63 in the cam groove permits the printing elements to descend until the type 65 engages the top of the closure 67. The valley 63 in the cam groove is formed to provide sufficient downward radial movement of the printing elements to effect printing engagement with the closures even though the bottles vary in height.

There is pivotally mounted in the slot of the blocks 50 and at the trailing side of the print block 64, a depending closure probe 70, this probe being pivotally mounted on a pin 71 extending through the bifurcated block 50, see Figures 11 and 12. The probe 70 carries a transversely extending bar 72 of sufficient length to overlie the top edge of the container. These probes 70 assume, by gravity, a depending position, as shown at the lower printing element in Figure 6. If there is a closure 67 on the top of the container, the probe 70 engages the closure top and is swung rearwardly from the direction in which the printing element is moved, see Figure 10, the bar 72 moving rearwardly of the pivot pin 71, permitting the printing element to descend and the type 65 to engage the top surface of the closure. However, if there is no closure on the container, the probe 70 will enter the opening in the top of the container and as the container and printing element advance together and the printing element moves downwardly because of the depression 63 in the cam track, the bar 72 extending transversely of the container top will engage the container top and will support or prevent downward movement of the printing element. This because the bar 72 is then directly below or slightly forward of the pivot pin 71 and thus, the printing type 65 will be prevented from engaging the container top or extending down into the container and contaminating the contents therein.

It will be observed, in Figures 10 and 11, that there is an additional threaded aperture 76 for the screw 66 in the blocks 50, and that there is also an aperture 77 in the bifurcated portion of the block 50 for the reception of a pin 71. This arrangement is to provide for the mounting of the type block 64 and the probe 70 for both a right and left hand capping machine or, in other words, to accommodate the printing apparatus for bottles moving to the right instead of to the left, Figure 2.

The furnishing roll 30 is provided with ink by an ink pot 80 pivotally mounted intermediate its ends on a pin 81 extending outwardly from a plate 82. The plate 82 is formed with a rib 83 on its inner side which is slidably mounted in a slot formed in the outer surface of the side wall 22, the plate being formed with elongated horizontal slots 85 for the reception of screws 86 which thread into the side wall 22, see Figures 2 and 4. With this arrangement, the plate 82, furnishing roll 30 and the ink pot 80, are adjustable toward and from the turret 27. To permit this adjustment, the side wall 22 of the housing is formed with a slot or enlarged opening 88 for the reception of the bearing portion 89 in which the shaft 31 is journalled.

The ink pot 80 is formed on its under side with an enlarged portion 90 apertured to receive the pivot pin 81. The portion of the pot extending toward the turret

27 is formed with an ink well 91 arranged so that when the pot is moved in a counterclockwise direction Figure 2, the ink well will encompass the lower portion of the furnishing roll 30. This end portion of the pot is provided with a doctor blade 92 formed with a notch 93 for the reception of the peripheral portion of the roll 30, and the bottom wall of the notch is formed with a bevel 94 to provide a knife edge confronting the periphery of the roll.

The pivot pin 81 is fixedly mounted in the plate 82 and extends outwardly therefrom, the pot being slidably and rotatably mounted upon the pin 81. The pot is normally maintained in horizontal operative relation to the roll 30, as shown in Figure 2, by stop means shiftable into and out of operative relation to the pot. This stop structure consists of a screw 95 slidable vertically in a projection 96 extending outwardly from the plate 82. A pair of lock nuts 97, 98, are threaded upon the upper end of the screw 95 and the screw is yieldingly urged downwardly by a compression spring 99 encircling the screw and being interposed between the projection 96 and a head 100 formed on the lower end of the screw.

The outwardly or rearwardly extending portion 101 of the ink pot is formed with a notch 102 arranged in registration with the head 100 of the screw. A plate 103 is positioned upon the upper surface of the pot portion 101 by a screw 104, the plate 103 being movable about the axis of the screw so that it overlies the notch 102 in which position it is engaged by the head portion 100 of the adjusting screw, see Figures 2 and 3. It will be observed that the pot is pivotally mounted intermediate its ends, the forwardly extending portion containing the ink well 91 being considerably heavier than the rearwardly extending portion of the pot whereby the pot is maintained in horizontal operative position by the adjusting screw and plate 103. In this position, the ink well portion 91 encompasses the lower portion of the furnishing roll 30 and the edge 94 of the doctor blade is positioned a predetermined distance from the periphery of the roll to remove excess ink therefrom and to provide the correct amount of ink to be deposited upon the type 65 as the type engages the periphery of the roll upon rotation of the roll and the turret, as will be apparent.

A second stop means is provided to prevent outward axial movement of the pot on the pivot pin 81. A slot 107 is formed in the outer end surface of the enlarged portion 90 of the pot and this enlarged portion is also formed with a slot or keyway 108 extending axially in the bore in which the pivot pin 81 is located. The outer end of the pivot pin 81 is provided with a radially extending pin 109 extending into the slot or notch 107, see Figures 2 and 3. When the pot is in normal horizontal relation to the furnishing roll, the pin 109 engages the bottom wall of the notch 107. When the pot is rotated in a clockwise direction Figure 2, until the key-way 108 is moved in registration with the pin 109, the ink well portion 91 is moved downwardly, as shown in Figure 15, from the rol 30, and the pot may be then moved axially outwardly off from the pivot pin 81.

The screw 95 is adjusted by the nuts 97, 98, to properly position the pot with the correct spacing between the doctor blade 92 and the periphery of the roll. To effect rotation of the pot on the pin for its axial outward movement therefrom, the plate 103 is swung outwardly about its mounting screw 104, as shown in Figure 16. To facilitate this operation, the plate is formed with an upwardly extending ear 110. When the plate is thus swung outwardly out of registration with the notch 102, the pot may be tilted about the axis of the pin 81, the head 100 of the screw being cleared by the notch 102. The pot is replaced on the pin 81 while tilted in the position shown in Figure 15 and then rotated counter-clockwise, and the plate 103 is then moved under the head portion 100 of the screw. With this

arrangement, the pot may be removed and replaced without effecting the adjustment of the stop screw.

What we claim is:

1. Apparatus for printing closures on an advancing procession of containers comprising a printing element movable downwardly in a vertical plane into printing engagement with the closure on the top of each container advancing in said procession, a closure probe pivotally mounted at its upper end to said printing element and depending vertically therefrom for free swinging movement in one direction, a stop carried by the printing element for restraining movement of said probe in the opposite direction, said probe being positioned to enter the open end of a container without a closure and being provided with a transversely extending member engageable with the top edge of the container, said member being mounted on the probe in vertical alinement with the pivot thereof whereby said printing element is supported by said probe out of engagement with the container top.

2. Apparatus for printing closures on an advancing procession of containers comprising a printing element movable downwardly in a vertical plane into printing engagement with the closure on the top of each container advancing in said procession, a closure probe pivotally mounted at its upper end to said printing element and depending vertically therefrom for free swinging movement in one direction, said printing element being provided with a stop for restraining movement of said probe in the opposite direction, said stop being positioned at one side of the vertical plane extending through the probe pivot, the lower end of said probe being positioned on the opposite side of said vertical plane, and

said probe being provided intermediate its ends with a transversely extending member engageable with the top edge of the container in the absence of a closure on a container top, said member being positioned in a plane extending intermediate said vertical plane and said stop when said probe is depending free from its pivot.

3. Apparatus for printing on closures on an advancing procession of containers comprising a printing element, motion transmitting mechanism operable to effect downward movement of said printing element into printing engagement with a closure on the top of each container advancing in said procession, a probe pivotally secured at its upper end to said printing element, said probe depending vertically from said pivot and being formed at its lower end with laterally extending portions for engagement with a container top about the opening thereof upon the absence of a closure on the container to prevent downward movement of said printing element, said probe being movable about said pivot out of the vertical upon engagement with a closure on a container.

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