Nov. 12, 1940. Y. H. KURKJIAN 2,221,711

PRINTING AND BEAD FORMING DEVICE

Filed Feb. 17, 1938 2 Sheets-Sheet 1

Fig. 1.

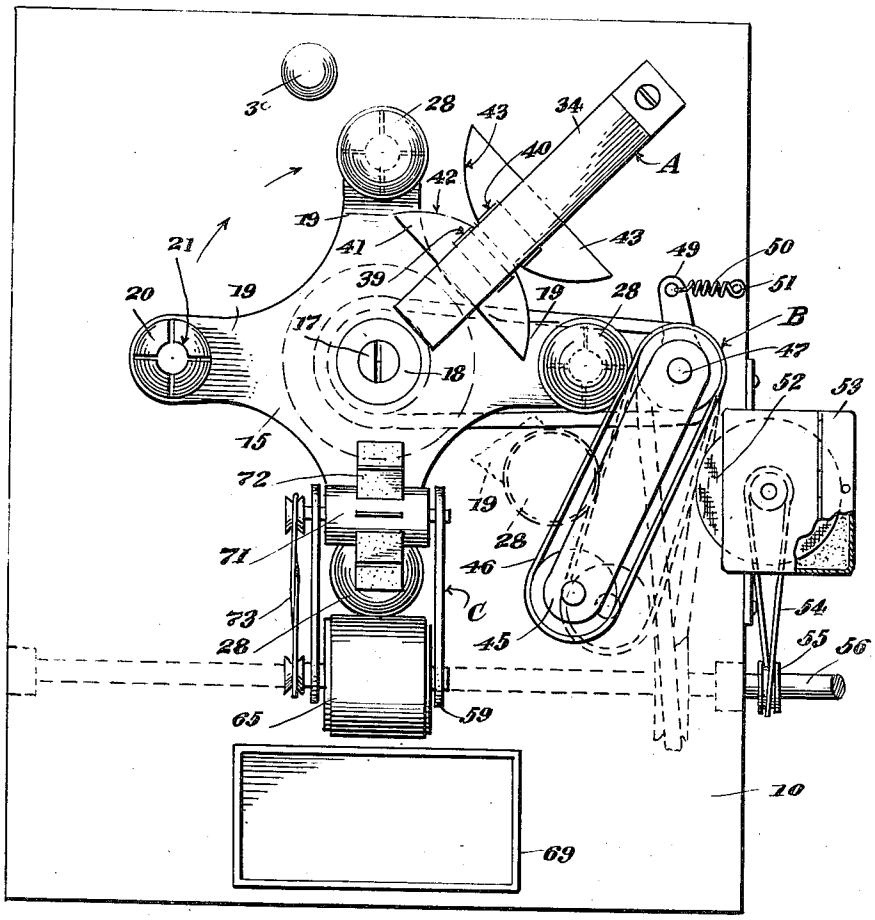
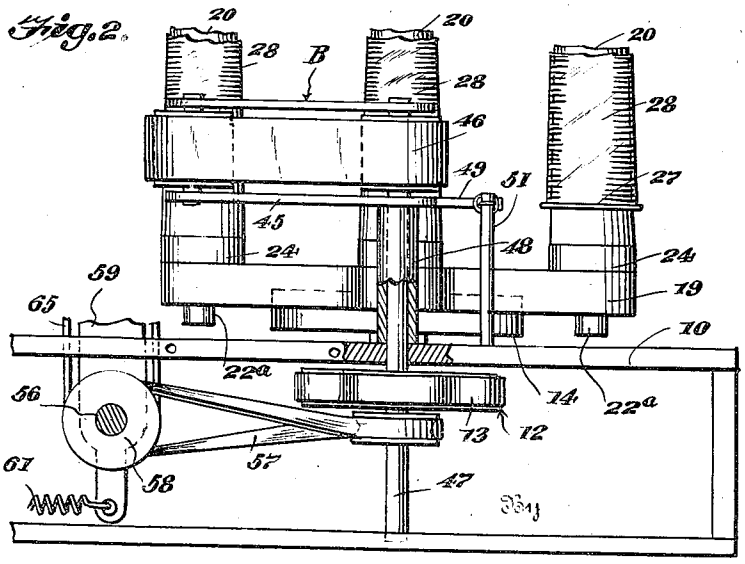


Fig. 2.



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Fig. 3.

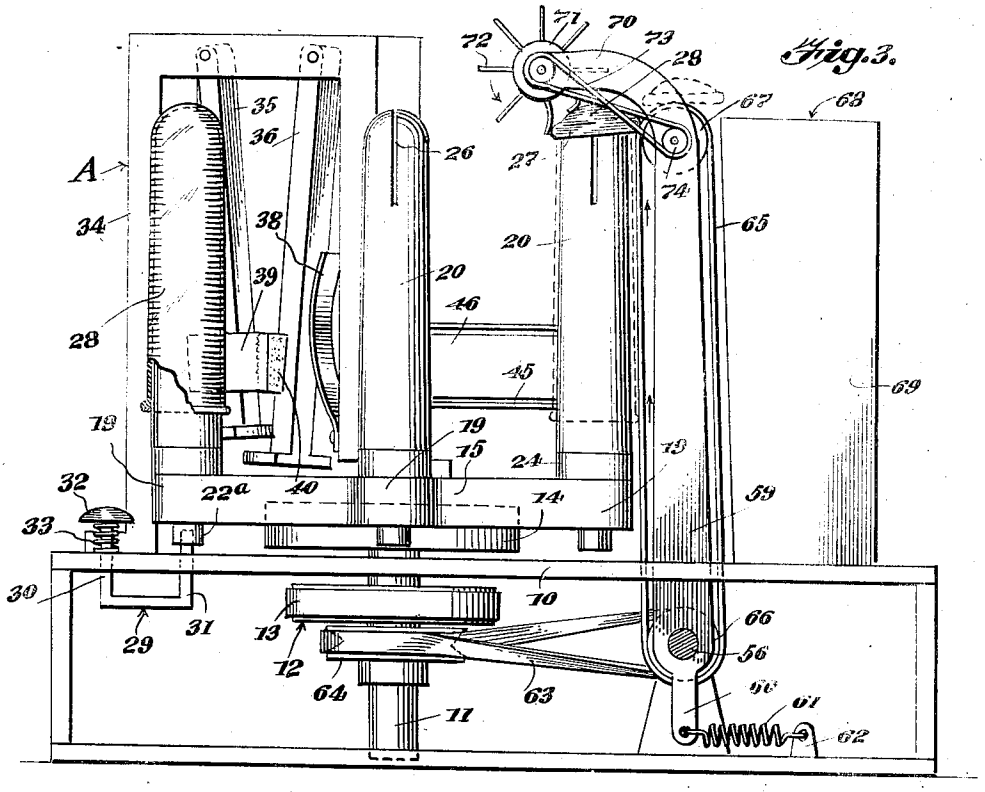


Fig. 4.

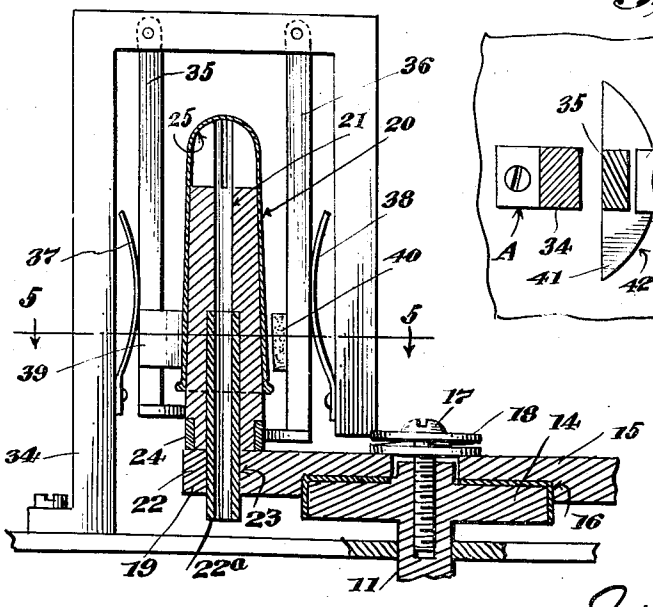
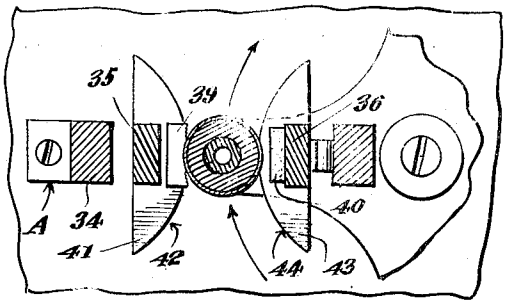


Fig. 5



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UNITED STATES PATENT OFFICE

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PRINTING AND BEAD FORMING DEVICE

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Application February 17, 1938, Serial No. 191,081

2 Claims. (Cl. 101—40)

This invention relates to a means for stamping or printing and preparing rubber goods or articles such as balloons, finger cots, and similar articles for packing or shipment, and has for one of its objects the production of a simple and efficient means for stamping or printing a trade-mark or other indicia upon the goods or articles and treating the same in a manner whereby the stamped or printed subject matter will not blur or rub while a bead is being rolled or formed upon the article.

A further object of this invention is the production of a simple and efficient means for rolling a bead upon rubber goods or articles such as balloons, finger cots, and the like, by rolling a bead upon itself from the lower portion of the article, through the medium of a lateral pressure frictional contact movable element to assure an economical and accurate operation in the rolling of the bead, as well as the removal of the article from its supporting form after the bead has been formed.

Other objects and advantages of the present invention will appear throughout the following specification and claims.

In the drawings:

Figure 1 is a top plan view of my device;

Figure 2 is a side elevational view, certain parts being shown in section, and the supporting forms being broken away;

Figure 3 is a side elevation of my device, looking at an opposite side from that as shown in Figure 2, certain parts being shown in section;

Figure 4 is a vertical sectional view through a portion of the dial or rotating table, one of the forms being shown in section and the printing apparatus being shown in side elevation;

Figure 5 is a transverse sectional view taken on line 5—5 of Figure 4.

By referring to the drawings, it will be seen that 10 designates a support which is preferably of a hollow box-like structure. A vertically extending power shaft 11 is supported by the base, and carries a power wheel 12 over which passes a suitable driving belt 13, which belt 13 may be driven from any suitable source of power. This power shaft 11 carries a frictional driving disc 14 at its upper end above the support 10 of which frictional driving disc 14 is fitted the dial or rotating table 15, the disc 14 fitting within the cavity 16 of the dial or rotating table 15, as shown in Figure 4. The dial or table 15 is secured in position through the medium of an anchoring screw 17, which screw 17 extends through a suitable spring washer 18 and is threaded into the upper end of the power shaft 11, as shown in Figure 4. The tension of the frictional contact between the dial 15 and the driving disc 14 may be regulated, of course, by the adjustment of the screw 17 to provide a proper frictional drive for the dial 15 and permit the dial 15 to be stopped periodically as will be hereinafter described.

The dial or rotating table 15 preferably comprises four radiating arms 19 and each arm 19 supports a vertically extending form 20 in the nature of a hollow tubular member tapering slightly toward its upper end and having a longitudinally extending passage 21 through its center extending from end to end and communicating with a vertically extending hollow tubular journal 22, the hollow tubular journal 22 being fitted into the lower end of the form 20, in a manner as shown in Figure 4. The lower end of the tubular journal 22 in each instance extends through an aperture 23 formed in the arm 19, as shown in Figure 4, in this way efficiently supporting the form 20 for rotation. The lower end of the form 20 preferably carries a reinforcing metal band 24, the form 20 being preferably formed of wood. The outer end of each form 20 is rounded, as indicated at 25, and a plurality of radiating and longitudinally extending channels 26 are formed in the outer face of the form 20 in each instance, so as to provide air escape channels leading to the central opening or bore 21, thereby allowing air to escape through the upper end of the form 20 as the bead 27 of the rubber article 28 is being rolled in the manner hereinafter described.

One of the purposes of the present invention is to facilitate the printing of a trade-mark or other indicia upon the rubber article 28 which is of a film-like rubber structure closed at its upper end and open at its bottom end, and which is adapted to be placed over the form 20 to fit upon the form in the manner shown in Figure 3. The dial 15 will be rotated through the medium of the friction drive previously described causing the dial 15 to travel in the direction of the arrows indicated in Figure 1.

In actual operation, it has been found practical for an operator to manually place the rubber article 28 over one of the forms 20, as one form passes the position of the operator, and it has been found preferable to have the dial 15 remain at rest while the article 28 is placed over the form 20. For this purpose, I provide a stop key in the nature of a U-shaped member 29 having vertically extending fingers 30 and 31 extending through the top of the base 10, as shown in Fig-

ure 3. The finger 30 carries a knob 32 at its upper end and a coil spring 33 which is interposed between the knob 32 and the upper face of the base 10. The finger 31 is adapted to normally lie in the path of travel of the lower ends 22a of the tubular journals 22 which depend below the dial 15. This finger 31 will cause one of the forms 20 to stop in a proper position in front of the operator as the dial 15 rotates in the direction of the arrows shown in Figure 1 due to the fact that the depending end 22a will abut against the upper end of the finger 31. When the operator has properly placed the rubber article 28 over the form 20, the dial 15 may be released by the operator merely pressing the knob 32 downwardly out of contact with the depending end 22a—note Figure 3, whereupon the friction drive will cause the table or dial 15 to continue in its movement. In this way, the table or dial 15 will intermittently rotate for each quarter turn, coming to rest at each quarter of a turn and will be manually released by depressing the stop key 29.

A printing mechanism A is carried by the support 10 in the path of movement of the forms 20, and at a position intermediate two of the forms when the dial 15 is at rest. This printing mechanism comprises a vertically extending frame 34 which is carried by the support 10 in any suitable or desired manner upon the upper end of which is pivotally hung a stamp supporting arm 35, and a pad supporting arm 36 in proper spaced relation and in the manner as shown in Figures 3 and 4. A flat spring 37 is carried by the frame 34 and engages the arm 35 normally forcing the arm 35 inwardly and a flat spring 38 is carried by the offset side of the frame 34 and engages the arm 36 for forcing the arm 36 inwardly to cause the stamp 39 carried near the lower end of the arm 35 to normally contact with the inking pad 40 carried by the lower end of the arm 36. The stamp 39 and also the pad 40 are located in a position upon the arms 35 and 36 so as to preferably stamp the article 28 near its lower open end as will be obvious by considering Figures 3 and 4.

The arm 35 is provided with a shoe 41 at its lower end having a convex inner face 42. The arm 36 is provided with a shoe 43 at its lower end having a convex inner face 44 the convex faces 42 and 44 facing toward each other and when the stamp 39 and pad 40 are in contact, the ends of the respectiive shoes 41 and 43 will provide a flaring opening in the direction of the entering form 20 as it passes in the direction of the arrows shown in Figure 1, and as the form 20 passes in the direction of the arrows shown in Figure 1, the base of the form 20 will contact with the convex faces 42 and 44 of the shoes 41 and 43 in the manner shown in Figures 4 and 5 and force the lower ends of the arms 35 and 36 from the position shown in Figure 3 to the position shown in Figures 4 and 5. The shoe 43 is of sufficient size to move the arm 36 to a position whereby the inking pad 40 will be out of contact with the article 28 as the form 20 carrying the article passes between the arms 35 and 36. The article 28 carried by the form 20 as it passes the printing pad 39, however, will merely roatate by, and in contact with, the stamp as the dial 15 is rotated, thereby causing a clear and distinct impression of the stamp to appear upon the article 28 as the form rolls across the face of the stamp. As soon as the form 20 carrying the article 28 which has been printed, passes from between the arms 35 and 36 the springs 37 and 38 will force the stamp 39 in contact with the pad 40 through the swinging of the arms from the position shown in Figure 4 to the position shown in Figure 3, re-inking the stamp, and at the same time because of the close contact provided, seal the face of the pad to prevent the pad from becoming dried out. This action will add greatly to the life of the pad as well as to the life of the stamp.

It is quite important in an operation of this character that the ink of the stamped impression upon the article 28 be treated in a manner so as to prevent it from smearing as the lower end of the article is rolled in a subsequent step. For this reason, I provide a special dusting medium for applying starch, talcum powder, or any other similar material which will efficiently dry the ink which has been stamped upon the article 28. To accomplish this result, I have provided a special dusting mechanism B, as shown in Figures 1 and 2, located in close proximity to the frame A. This dusting mechanism preferably comprises a frame 45 which supports an endless conveyor belt 46 in a manner shown in Figures 1 and 2, which endless conveyor belt is driven from a vertically extending shaft 47. The shaft 47 is driven by means of the belt 57. The conveyor belt 46 extends in the direction of the path of movement of the forms 20. The frame 45 is preferably supported upon a hollow standard 48 carried by the base 10 in the manner shown in Figure 2 for swinging movement toward and away from the center of the dial 15, as is indicated in dotted lines in Figure 1 and this frame 45 is provided with a projecting arm 49 which arm 49 is engaged by a coil spring 50 anchored at its opposite end to a post 51 carried by the base 10. This spring 50 normally yieldably holds the conveyor belt 46 in contact with the article 28 carried by one of the forms 20 as it passes the belt 46. As one of the forms 20 carrying the article 28 passes in the direction of the arrows shown in Figure 1 and moves to the position shown in dotted lines in Figure 1, the frame 45 will be swung to the position shown in dotted lines in Figure 1 where the conveyor belt 46 will contact with a dusting roller 52 mounted within a dusting cabinet 53 supported upon the base 10 in a proper position for contact with the belt 46. This dusting roller 52 may be driven by a belt 54 through the medium of a pulley 55 carried by the shaft 56. As the dial 15 travels in the direction of the arrows shown in Figure 1, the frictional contact of the outer face of the article 28 carried by the form 20 by rolling over the belt 46 will cause the article 28 to be thoroughly dusted and the printed subject matter properly treated for preventing smearing. The belt 46 is driven through the medium of the shaft 47, which shaft 47 is in turn driven through the medium of the belt 57, the belt 57 being driven by a pulley 58 carried by the shaft 56.

Through this operation, the conveyor belt 46 will be periodically engaged by one article, such as the article 28, carried by one of the forms 20 for properly dusting, and this movement will swing the frame 45 carrying the belt 46 into contact with the dusting roller 52, thereby periodically renewing the dusting of the conveyor belt 46.

After having stamped and then dried the article, the next step necessary for properly handling the article is the removal of the article from the form such as the form 20. I, therefore, have provided a specially constructed removing device C which is preferably located in

spaced relation from the dusting device and in the path of movement of the forms 20 as they are moved through the rotation of the dial. The printing device A is preferably located at a point between the first and second quarter turns, the dusting device B being located at a point approximately the beginning of the third quarter turn. It should be understood, however, that the exact location of the printing, dusting and removing devices may be varied without departing from the spirit of the invention, the locations at present illustrated having been found to be an efficient arrangement for speedy operation, accurate timing, and efficient manipulation. In order to facilitate the removal of the article 28 from the form 20, and the formation or rolling of the bead 27, I provide a vertically extending conveyor belt supporting frame 59 which extends vertically of the base 10, the lower end of the frame 59 being journaled upon the shaft 56 and being provided with a depending arm 60 which engages a spring 61. The spring 61 is anchored upon the base 10, as at 62, and normally swings the frame 50 in the direction of the forms 20 carried by the dial 15. The shaft 56 is driven through the medium of a belt 63, the belt 63 passing over a pulley 64 carried by the power shaft 11.

The conveyor belt frame 59 carries a vertically operating conveyor belt 65 which passes over a lower pulley 66 and an upper pulley 67, the upper pulley 67 being located adjacent the upper end 68 of the vertical receiving bin 69 carried by the base 10. The conveyor belt 65 is placed in a position between the dial 15 and the bin 69 as shown in Figure 3. The spring 61 will frictionally hold the belt 65 at a tension in frictional wiping contact to prove lateral pressure frictional contact upon the lower end of the article 28, thereby causing the bead 27 to be rolled upwardly in the direction of the arrows shown in Figure 3 until the bead 27 has taken the position shown in Figure 3, the channels 26 permitting the escape of air and preventing the compression of air under the outer end of the article 28 due to the fact that the air may pass through the channels 26 down through the bore 21 and out through the lower end of the tube 22.

The frame 59 is provided with an overhanging end 70 which overhangs the path of movement of the forms 20 as they pass while the dial 15 is rotating. The outer extremity of the overhanging end 70 supports a wheel 71 which is provided with a plurality of flexible blades or fingers 72 preferably formed of rubber and this wheel 71 is driven through the medium of a cross belt 73 from a shaft 74 carried by the pulley 67, the wheel 71 traveling in the direction of the arrows. As the article 28 reaches the upper end of the form 20, as shown in Figure 3, the resilient or flexible finger 72 will contact with the article 28 and shift the same off the upper end of the form 20, the inner edge of the bead 27 being engaged by the upper end of the conveyor belt 65 causing the article 28 to ride over the upper end of the conveyor belt in the manner shown in dotted lines in Figure 3, and be deposited into the receptacle or bin 69.

Through the medium of the present machine, the operations of stamping a rubber article, and rolling a bead from the bottom edge, are greatly facilitated, and the time involved is shortened. Furthermore, the present machine provides a compact arrangement, the various elements of which may be closely arranged and need not be spaced at great distance to provide time for drying between the time of stamping and the time of rolling the bead. The dusting of the wet stamped indicia through the medium of the dusting belt 46 cuts down the time and distance of operation, eliminating the usual long conveyor belt system and permitting the various parts performing the various steps of operation to be closely arranged in compact relation and thereby provides an economically operated machine occupying a minimum amount of space.

The method employed in the operation of my device is as follows—The operator will stand in front of the machine adjacent the actuating knob 32 and will manually slip one of the articles 28 over the upper end of one of the forms 20, and then release the dial 15 by pressing the knob 32 downwardly whereupon the frictional driving will cause the dial 15 to rotate in the direction of the arrows shown in Figure 1, causing the form upon which the article 28 has been placed to force its way between the shoes 41 and 43 spreading the arms 35 and 36 apart and causing the lower end of the rubber article 28 to roll across the face of the stamp 39. This will cause an impression from the stamp to be printed upon the outer face of the article 28 adjacent the stamp, and because of the structure of the shoe 44 the pad 40 will be held out of contact with the article 28 as is shown in Figure 5. After the article 28 carried by the form 20 has moved beyond the stamp, the arms 35 and 36 will be swung toward each other at their lower ends, the shoes 41 and 43 overlapping and allowing the stamp 39 to snugly contact with the pad 40 thereby re-inking the stamp and making it ready for the next operation.

After the form 20 which carries the article 28 has passed through the printing device A, it next contacts with the endless conveyor belt 46 which travels in a horizontal direction and is located in alignment with the printed or stamped indicia of the article 28, and the continued movement of the form 20 which carries the article 28 causes the frame 45 to be swung to the position shown in dotted lines in Figure 1 where the conveyor belt will contact with the dusting roller 52.

As the form 20 which carries the article 28 moves to a third position, the lower edge of the article 28 is gripped by the lateral friction moving contact of the vertically traveling conveyor 65 for rolling the bead 27 vertically on the form 20, where the rolled article 28 is then kicked off and conveyed into the bin or receptacle.

It should be understood that the various parts are properely timed to operate in sequence, and that the freely rotatable forms 20 may roll in proper timed relation over the face of th printing stamp 39 as well as the dusting belt 46 to insure a clear and clean-cut impression.

It should be further understood that certain detail changes in the mechanical construction, combination, and arrangement of parts may be employed without departing from the spirit of the invention, so long as such changes fall within the scope of the appended claims.

Having described the invention, what I claim as new is:

1. In an apparatus of the class described, a support, a rotating dial, a plurality of upstanding forms carried by the dial and arranged on the radius of a circle, a printing frame arranged in the path of movement of the forms, a stamp carrying arm pivotally suspended within the

frame and adapted to print indicia upon an article carried by the form as the form moves by the stamp, means for re-inking the stamp, and inwardly extending convex feet carried by the printing frame and the means for re-inking the stamp, the forms being adapted to pass between the convex feet for forcibly separating the feet, thereby separating the printing frame and the means for re-inking the stamp as the forms pass therebetween.

2. In an apparatus of the class described, a support, a rotating member carried by the support, a plurality of upstanding forms carried by rotating member, printing means arranged in the path of movement of the forms, said printing means adapted to print indicia upon an article carried by a form as the form moves by the printing means, a re-inking pad adapted to contact the printing means in an obstructing position in the path of movement of the forms, and means carried by the printing means and re-inking pad adapted to be engaged by the forms as they pass the printing means for forcibly moving the printing means and re-inking pad and moving the printing means to a printing position relative to the forms and out of contact with the re-inking means.

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