J. RANZ.

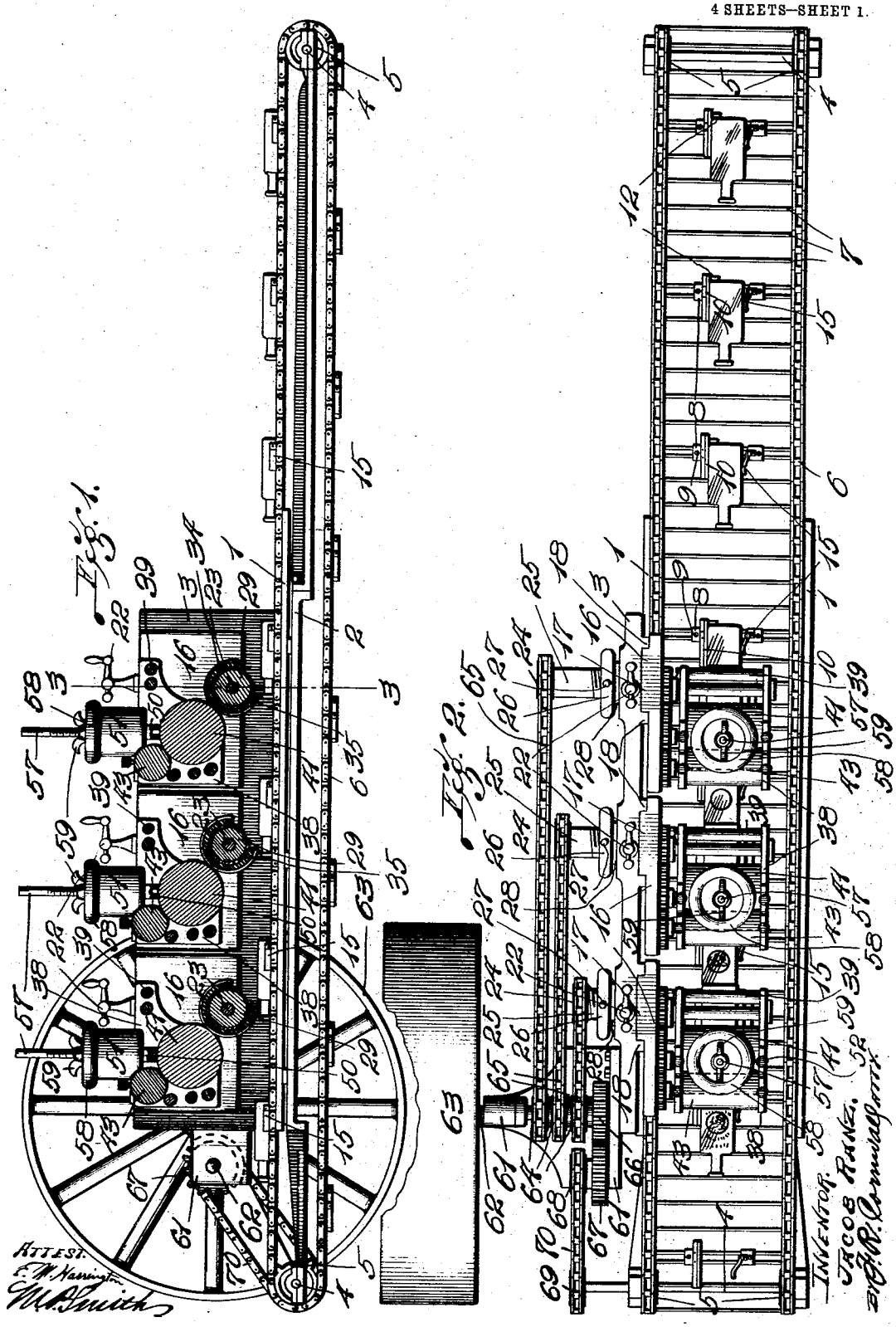
MACHINE FOR PRINTING ON BOTTLES.

APPLICATION FILED AUG. 23, 1909.

1,012,156.

Patented Dec. 19, 1911.

4 SHEETS—SHEET 1.



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4 SHEETS—SHEET 2.

Fig. 3.

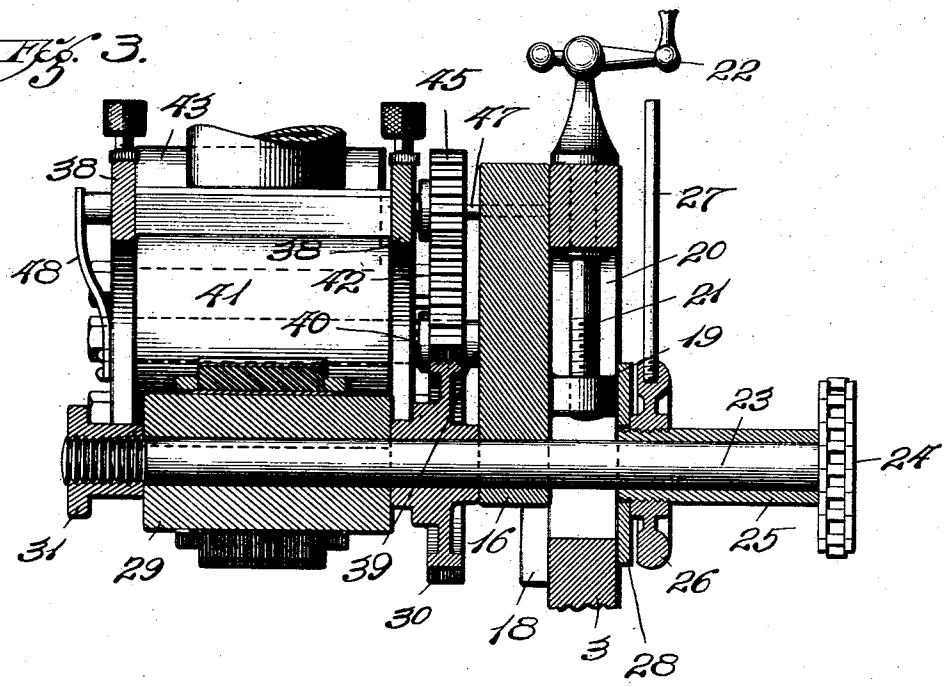


Fig. 4.

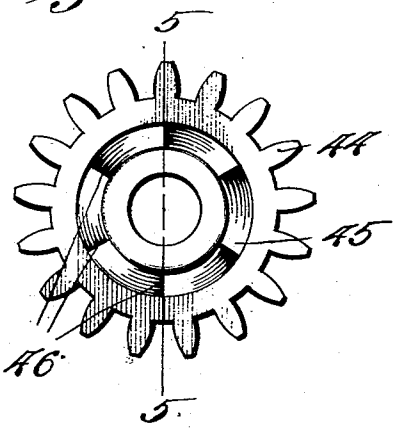
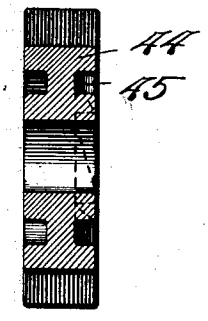


Fig. 5.



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W. C. Smith

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4 SHEETS—SHEET 3

Fig. 6.

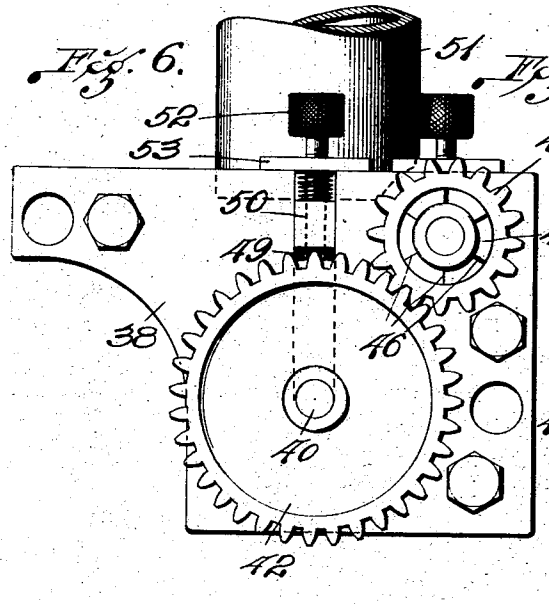


Fig. 7.

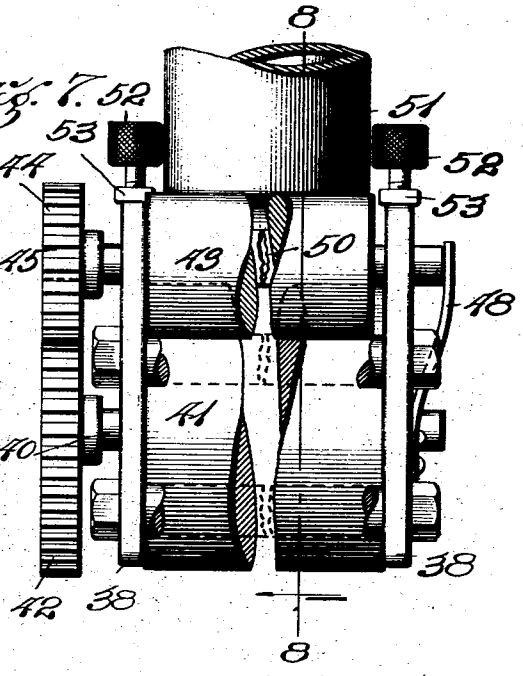


Fig. 8.

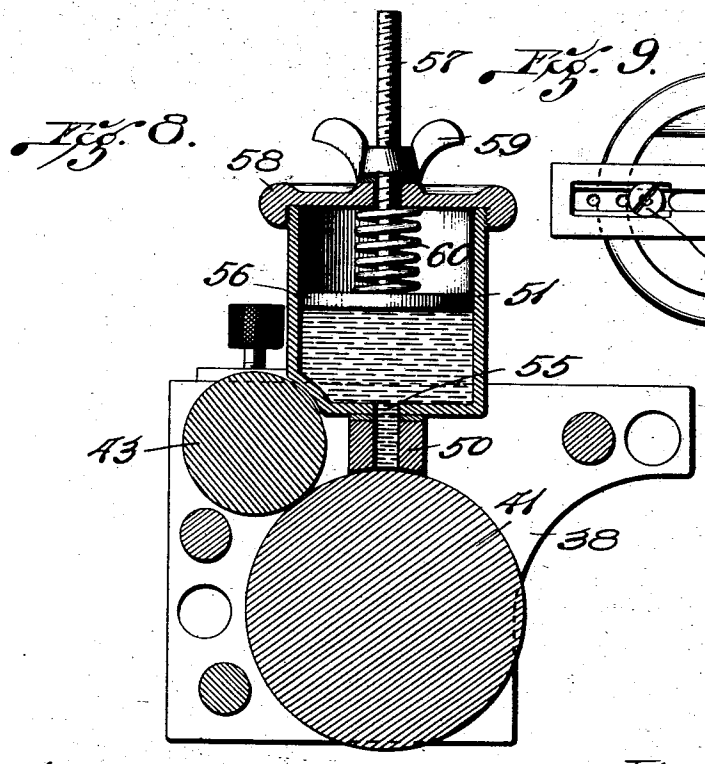
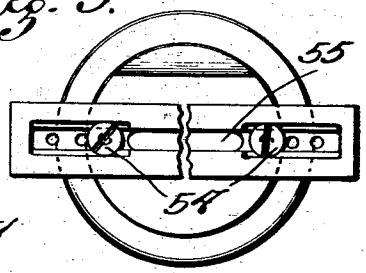


Fig. 9.



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4 SHEETS—SHEET 4.

Fig. 10.

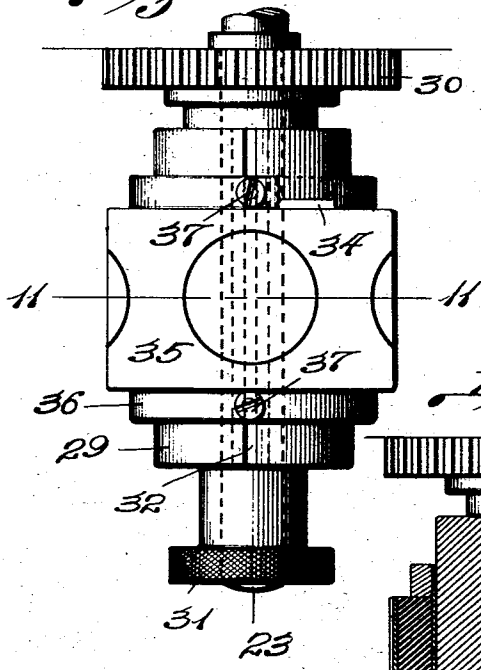


Fig. 11.

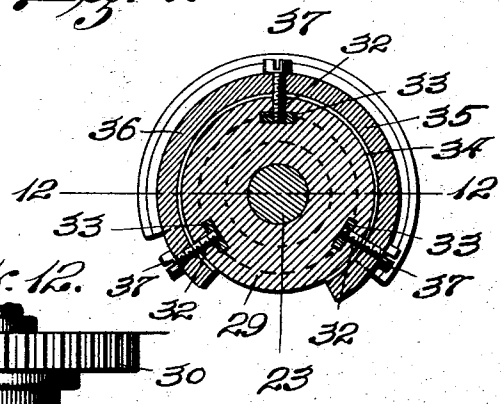


Fig. 12.

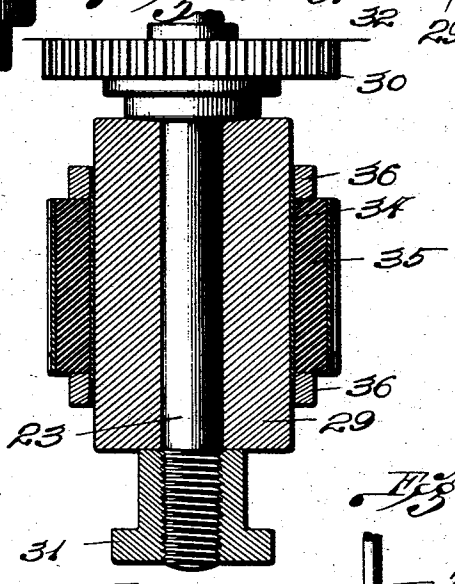


Fig. 13.

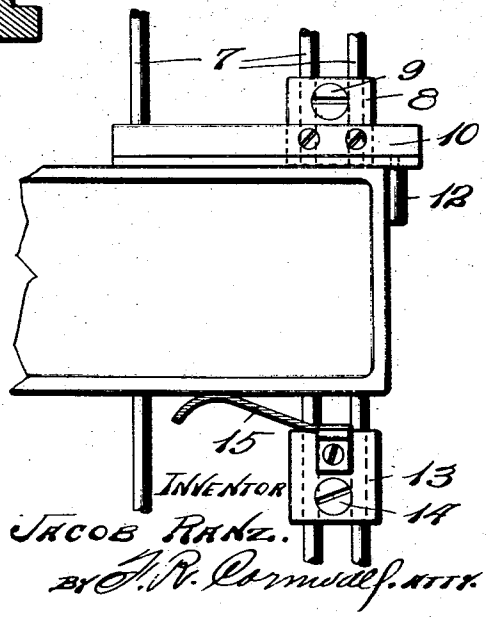


Fig. 14.

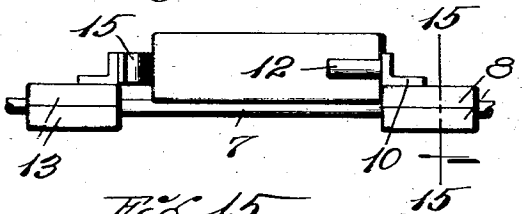
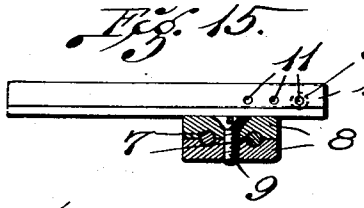


Fig. 15.



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UNITED STATES PATENT OFFICE.

JACOB RANZ, OF ST. LOUIS, MISSOURI, ASSIGNOR TO LOUIS HILFER, OF ST. LOUIS, MISSOURI.

MACHINE FOR PRINTING ON BOTTLES.

1,012,156. Specification of Letters Patent. **Patented Dec. 19, 1911.**

Application filed August 23, 1909. Serial No. 514,203.

To all whom it may concern:

Be it known that I, JACOB RANZ, a citizen of the United States, residing at St. Louis, Missouri, have invented a certain new and useful Improvement in Machines for Printing on Bottles, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation of a bottle printing machine of my improved construction, and showing the printing and inking rollers in vertical section. Fig. 2 is a plan view of the machine. Fig. 3 is an enlarged vertical section taken on the line 3—3 of Fig. 1. Fig. 4 is an elevation of a pinion made use of in my improved machine for imparting reciprocating movement to the ink-spreading rollers. Fig. 5 is a vertical section taken on the line 5—5 of Fig. 4. Fig. 6 is an elevation of a part of the printing mechanism. Fig. 7 is an elevation illustrating the inking and ink-spreading rollers and their driving gears. Fig. 8 is a vertical section taken on the line 8—8 of Fig. 7. Fig. 9 is a view looking against the under side of the ink fountain and the slotted supporting bar therefor. Fig. 10 is a plan view of one of the printing rollers. Fig. 11 is a cross section taken on the line 11—11 of Fig. 10. Fig. 12 is a horizontal section taken on the line 12—12 of Fig. 11. Fig. 13 is a plan view of a portion of the bottle carrier, and illustrating the adjustable bottle-engaging means. Fig. 14 is a rear elevation of the bottle-engaging means. Fig. 15 is a cross section taken on the line 15—15 of Fig. 13.

My invention relates to a machine for printing on bottles, my object being to provide simple means whereby various matter, such as trade marks, directions, and advertising matter, may be printed directly upon the surfaces of bottles with vitrifiable ink, which when the bottles are subjected to sufficient heat, becomes vitrified, thereby providing said bottles with permanent labels or marks.

Further objects of my invention are to provide a plurality of printing rollers whereby a mark or label of several different colors may be applied to a bottle, to provide means whereby all the printing and inking rollers and the bottle carrier are driven from a single shaft, to provide adjustable bottle carriers, adjustable printing roller carriers, adjustable printing members or plates on the rollers, and to provide metal backs for the printing members or plates.

To the above purposes, my invention consists in certain novel features of construction and arrangement of parts, hereinafter more fully described and claimed.

Referring by numerals to the accompanying drawings, 1 designates a horizontally disposed member which forms the bed plate of my improved machine, the same being supported upon a suitable base 2, and formed on or fixed to the rear side of the bed plate is a vertically disposed plate 3.

Located in suitable bearings at the ends of the base 2 are transversely disposed shafts 4, and fixed thereon are sprocket wheels 5, on which travel sprocket chains 6. These chains pass over the bed plate 1, and arranged at suitable distances apart and uniting the links of these chains are transversely disposed rods 7. The chains 6 and rods 7 comprise the bottle carrier of my improved machine, and arranged on the transverse rods at suitable distances apart are devices which receive and hold the bottles during their passage through the machine. Each bottle-engaging device comprises a pair of blocks 8 adjustably clamped on an adjacent pair of the rods 7 by means of a screw 9, and carried by the upper one of said blocks is a longitudinally disposed bar 10, in the rear end of which is formed a series of apertures 11 adapted to receive one end of a pin 12.

Located directly opposite the blocks 8 and on the same pair of rods 7 is a pair of blocks 13, which are adjustably clamped on said rods by means of a screw 14, and carried by the upper one of said blocks 13 is a flat spring 15, the free end of which projects toward the bar 10.

The bottles to be printed by my improved machine are placed on top of the transverse rods 7, with one side against the bar 10, the opposite side being engaged by the spring 15 and the base of said bottle against the

pin 12. The resiliency of the spring 15 holds the bottle in proper position during its travel through the machine.

Arranged for vertical adjustment on the front side of the plate 3 is a series of plates 16 which carry the printing and inking rollers, and all of these plates and the parts carried thereby are identical in construction and operation. Each plate is provided on its rear side with a vertically disposed lug 17 which operates between guide ribs 18 formed on the plate 3, and formed integral with each lug is a rearwardly projecting ear 19 which operates in a vertically disposed slot 20 formed in the plate 3. The screw threaded lower end of an adjusting rod 21 is seated in the ear 19, the upper portion of which rod is journaled in the top of the plate 3 and being provided with an operating handle 22. By this construction the plate 16 and parts carried thereby is adjusted vertically.

Journaled in the lower portion of each plate 16 is a shaft 23 which extends through the slot 20, and fixed on the rear end of said shaft is a sprocket wheel 24. Located on the shaft 23 between the sprocket wheel and the plate 3 is a sleeve 25, the inner end of which is threaded to receive a locking nut 26, which latter carries a pin 27 whereby said nut is manipulated. Interposed between the nut 26 and the plate 3 is a disk 28.

Mounted on the shaft 23 immediately over the central portion of the bed plate 1 is a cylinder 29, and located on said shaft 23 between this cylinder and the plate 16 is a pinion 30. The end of the shaft 23 adjacent the cylinder 29 is threaded and receives a locking nut 31, which bears against the outer end of said cylinder 29 to hold the same tight upon said shaft 23. Formed in the cylinder 29 and extending longitudinally thereof is a series of slots 32 which are T-shaped in cross section, and located in said slots are blocks 33. Carried by the central portion of the cylinder 29 is a segmental plate 34 of thin sheet metal, and carried thereby is a segmental printing member 35, of rubber or analogous material, the outer face of which is provided with the mark or type face of the printed matter which is to be applied to the bottles.

36 designates segmental clamping rings which engage the ends of the plate 34, and passing through said rings and into the blocks 33 which occupy the slots 32 are set screws 37. This construction permits the printing member 35 to be adjusted longitudinally and circumferentially upon the cylinder 29.

Arranged above and in front of the printing roller is a pair of plates 38 which are carried upon bolts 39 seated in the plate 16, and journaled in said plates are the trunnions of an inking roller 41, the periphery of which contacts with the surface of the printing member 35. One of the trunnions 40 of this inking roller extends through the bearing formed in the rear one of the plates 38, and fixed on said extending trunnion is a pinion 42 which meshes with the pinion 30 on the shaft 23.

Journaled in the plates 38 above and to one side of the inking roller 41 is an ink-spreading roller 43, the periphery of which contacts with the periphery of the inking roller 41. The trunnion on the rear end of this ink-spreading roller projects through the rear one of the plates 38 and is provided with a pinion 44 which meshes with the pinion 42. Formed in the outer face of this pinion 44 is a groove 45, the bottom of which is provided with a series of inclined shoulders 46. Seated in the plate 16 and bearing against the shoulders 46 is a pin 47. The trunnion on the front end of the ink-distributing roller 43 projects through the front one of the plates 38, and bearing against the end of said trunnion is the free end of a flat spring 48.

By the construction just described, the ink-distributing roller 43 reciprocates during its rotation, thus evenly distributing the ink over the periphery of the inking roller 41.

Formed in the plates 38 immediately above the trunnions of the inking roller 41 are vertically disposed slots 49, and arranged for vertical movement therein are the ends of a transversely disposed slotted bar 50 which carries the ink fountain 51. This bar 50 is adjusted vertically by means of screw rods 52 which pass through plates 53 fixed on top of the plates 38, the lower ends of said screw rods being loosely mounted in the ends of the bar 50. The slot in the bar 50 does not extend the entire length thereof, and to prevent the ink discharging from the slot in the said bar from spreading laterally, screws 54 are adjustably arranged on the under side of the bar 50 at the ends of the slot therethrough, the heads of which screws are countersunk in said bar in order to present a smooth surface against which the inking roller 41 engages. The bottom of the ink fountain 51 is provided with a discharge opening 55 which communicates with the slot through the bar 50. Located within the fountain is a follower plate 56 which is provided with a screw threaded stem 57, which latter projects through an opening formed in the center of the screw cap 58 of the ink fountain, and mounted on the upper end of said stem is a wing nut 59. An expansive coil spring 60 is located on the stem 57 between the plate 56 and cap 58, thus normally forcing said plate downward, and consequently effecting a force feed of the ink from the fountain.

Journaled in bearings 61 at the left hand

end of the plate 3 is a shaft 62, on the outer end of which is mounted a belt wheel 63. Fixed on this shaft between the bearings 61 is a series of equal sized sprocket wheels 64 which are in alinement with the various sprocket wheels 24, and connecting each sprocket wheel 64 and corresponding sprocket wheel 24 are sprocket chains 65. In this manner all of the printing and inking rollers are driven simultaneously and at the same rate of speed.

Fixed on the inner end of the shaft 62 is a pinion 66, and meshing therewith is a pinion 67 journaled in suitable bearings and carrying a sprocket wheel 68. Fixed on the end of the shaft 4 at this end of the machine is a sprocket wheel 69, and connecting the same with the sprocket wheel 68 is a chain 70.

The mechanism just described provides means for driving the carrier on which the bottle-engaging devices are mounted.

In the present instance, I have shown and described a machine adapted for printing three colors, although it will be understood that additional colors may be printed by extending the plate 3 and locating additional printing and inking rollers thereon.

When my improved machine is in operation, power is applied to the shaft 62 by means of a belt operating on the wheel 63, and by means of the various sprocket chains and sets of gearing, the printing and inking rollers are simultaneously driven by the same rate of speed and the carrier is operated in proper time relation, so that the bottles on the carrier are brought into position to be engaged by the printing members at the proper intervals. The bottles are placed in the bottle-engaging devices at the right hand end of the machine, and as each bottle is carried beneath the printing roller, the surface of the printing member 35 engages the top surface of the bottle and applies the background or border of the matter to be printed on the bottle. The bottle, on coming in contact with the second printing roller, receives a mark or marks printed in one color, and on coming in contact with the third roller receives printed matter or marks of a different color. After the bottles are discharged from the machine at the left hand end thereof, they are subjected to suitable heat, which vitrifies the ink applied to said bottles, thereby fixing the same and providing a permanent label.

During the operation of the machine, the ink is forced from the ink fountain 51 by the plate 56, and feeds through the slotted bar 50 onto the surface of the inking roller 41, and the ink is evenly distributed over the surface of said inking roller by the distributing roller 43, which reciprocates during its rotation. The reciprocating movement of the roller 43 is brought about by continual pressure exerted by the spring 48 on the trunnion at one end of said roller, and the bearing of the shoulders 46 in the groove 45 against the pin 47 at the opposite end of said roller. The rotary motion of the shaft 23 is imparted to the rollers 41 and 43 by means of the pinions 30, 42 and 44. The amount of ink fed to the inking roller 41 is regulated by varying the height of the slotted bar 50, which is accomplished by manipulating the screw rods 52, thereby varying the space between the under side of the slotted bar and the periphery of the inking roller 41. The plate 16 and parts carried thereby is adjusted vertically by means of the screw rod 21, and thus a light or heavy impression may be printed on the surface of the bottle, as desired. After the proper adjustment of the printing roller has been obtained by means of the screw rod 21, the lock nut 26 is tightened on the threaded end of the sleeve 25, thus causing the disk 28 to bear against the outer face of the plate 3, thereby locking the various parts in their adjusted positions and holding the same against undue vibration during operation. The printing member 35 is adjusted longitudinally and circumferentially upon the sleeve 29 by loosening the set screws 37, thus permitting the printing member 35, plate 34, and locking rings 36 to be moved lengthwise upon said cylinder, and also permitting the plate 34 and the printing member 35 to be shifted circumferentially. When the screws 37 are tightened, the rings 36 clamp the edges of the plate 34, and thus lock the printing member in proper position.

It will be noted that in my improved machine, all of the printing rollers, inking rollers and the bottle carrier are driven from one shaft. Therefore said parts operate uniformly and in proper time relation. The printing members or plates 35 are carried by the metal plates 34, and are held on the cylinders in such a manner as to be readily adjusted and easily removed.

A machine of my improved construction is comparatively simple, is easily adjusted, may be operated with little power, and provides means whereby permanent labels or printed matter may be applied directly upon the surfaces of bottles or the like.

I claim:

1. In a machine of the class described, a frame, a bed plate on said frame, a carrier arranged to travel over said bed plate, bottle engaging devices on the carrier comprising a pin arranged transversely of the carrier, a lug at right angles thereto, and a spring member arranged oppositely to the lug, a series of printing rollers positioned above the bed plate, the printing surfaces of which rollers engage the bottle, and means for operating the printing rollers and carrier.

2. In a machine of the class described, a continuous conveyer for bottles, comprising a series of bars arranged transversely of the carrier, blocks slidably mounted on certain of the bars and adapted to be clamped in position thereon, spring members adjustably mounted on the same rods, and printing means arranged above the conveyer.

3. In a machine of the character described, a frame, a bed plate on said frame, a carrier arranged to travel over said bed plate, and bottle engaging devices on the carrier comprising a pin arranged transversely of the carrier, a lug at right angles thereto, a spring member arranged oppositely to the lug, and printing means positioned above the carrier.

4. In a machine of the class described, a frame, a bed plate thereon, a carrier adapted to receive and convey bottles over said bed plate, a series of independently movable vertically adjustable plates on the frame, to one side of the bed plate rotary printing means carried by each vertically adjustable plate, a main driving shaft, driving connections therefrom to each one of the rotary printing means, and a driving connection from the main driving shaft to the bottle carrier.

5. In a machine of the class described, a frame, comprising a bed plate and a vertically disposed plate, an endless carrier adapted to receive bottles and convey the same over the bed plate, a series of independently movable plates positioned on the vertically disposed plate, means whereby the independently movable plates are adjusted vertically, a rotary printing member carried by each independently moving plate, a main driving shaft, a driving connection from said shaft to each rotary printing member, and a driving connection from the main driving shaft to the endless carrier.

In testimony whereof I hereunto affix my signature in the presence of two witnesses, this 19th day of August, 1909.

JACOB RANZ.

Witnesses:
M. P. SMITH,
LENORE CLARK.