March 1, 1932. J. KANTOR 1,847,485

AUTOMATIC BOTTLE FILLING MACHINE

Filed March 14, 1930 3 Sheets-Sheet 1

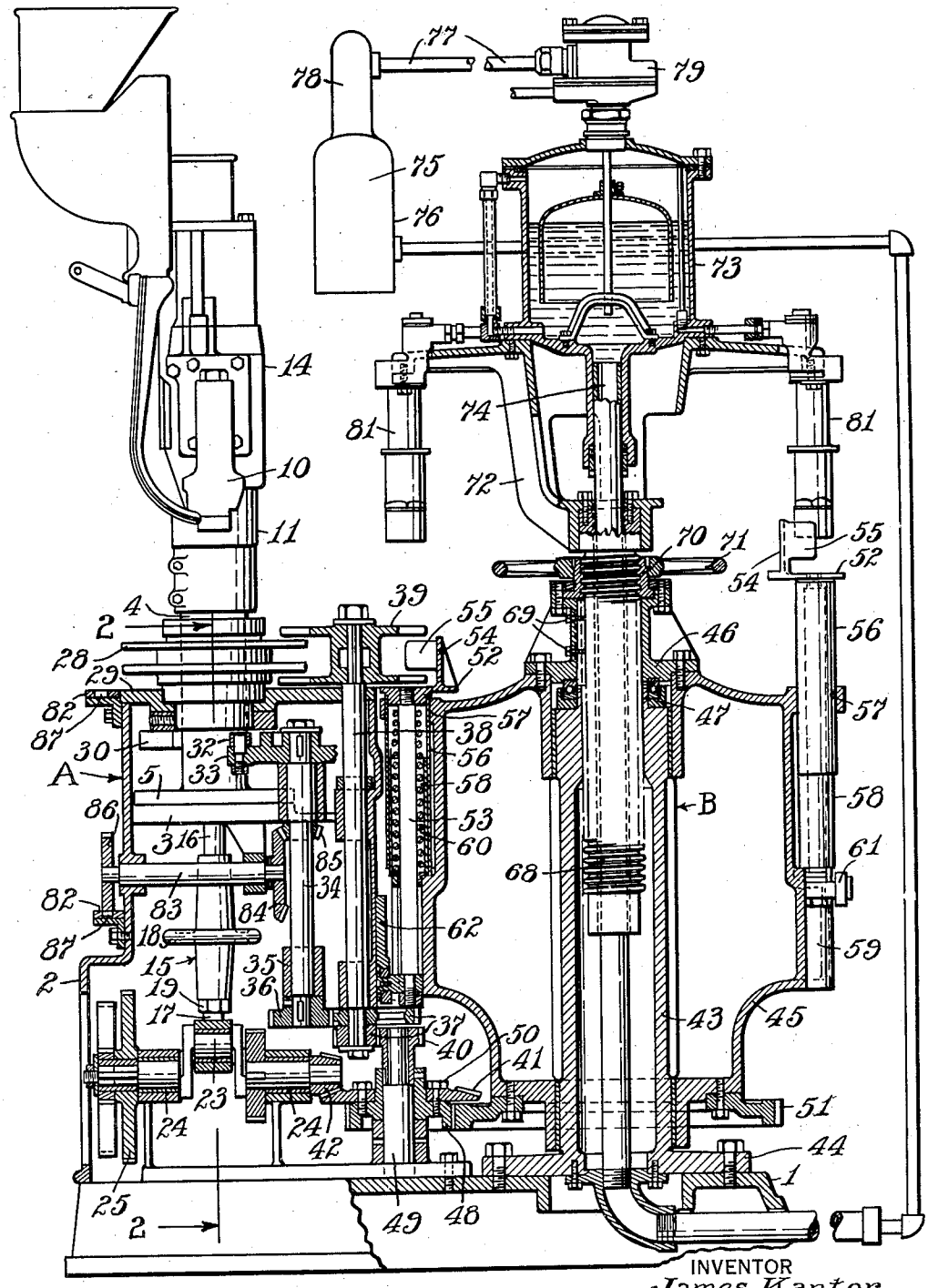


Fig. 1.

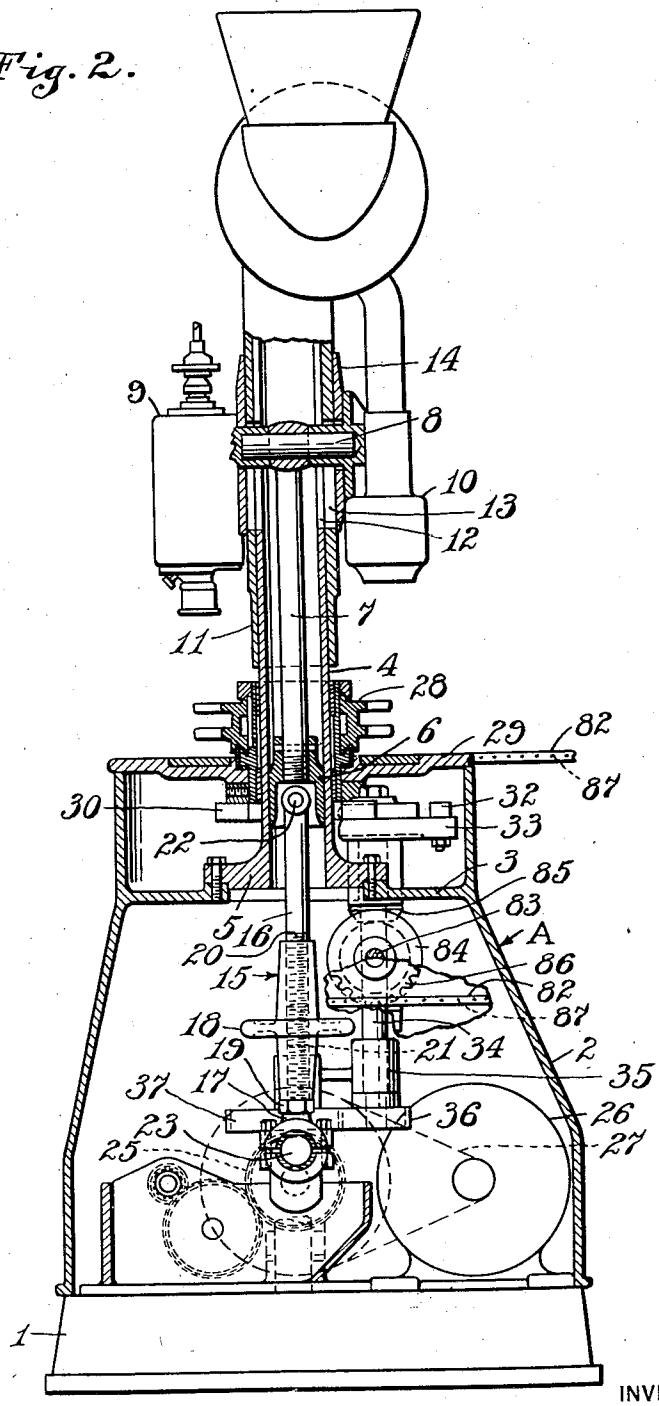
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Fig. 2.



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Fig. 3.

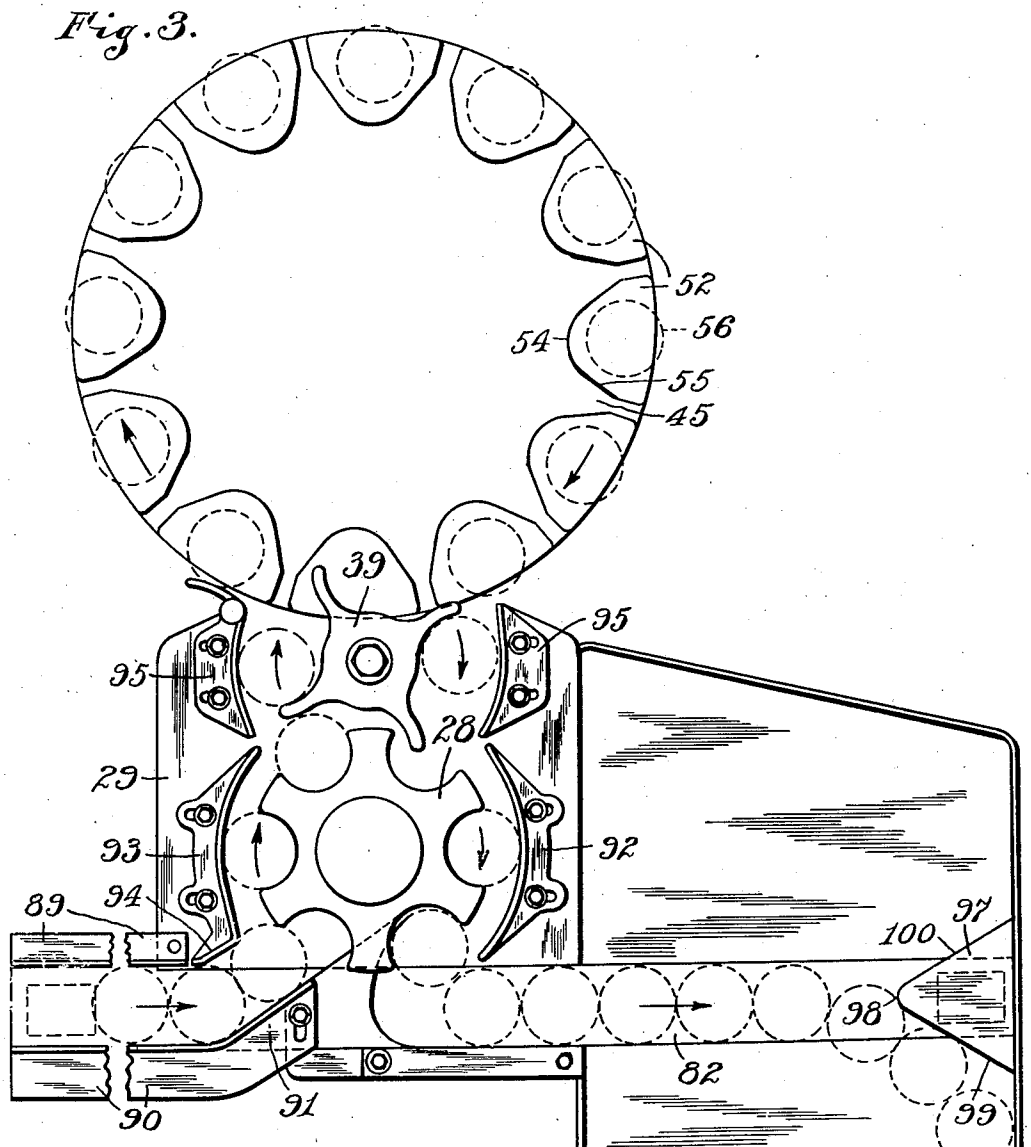
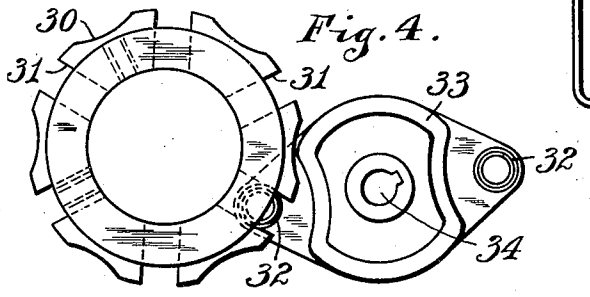


Fig. 4.



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Patented Mar. 1, 1932

1,847,485

UNITED STATES PATENT OFFICE

JAMES KANTOR, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE LIQUID CARBONIC CORPORATION, OF CHICAGO, ILLINOIS, A CORPORATION OF DELAWARE

AUTOMATIC BOTTLE FILLING MACHINE

Application filed March 14, 1930. Serial No. 435,699.

My invention relates to improvements in automatic bottle filling machines and has for one of its objects that of providing a syruping and crowning means which are so arranged that they may be actuated simultaneously for depositing the syrup in one bottle while another bottle which has been filled with syrup and liquid may be crowned.

Another object of my invention is to provide means for feeding the bottles to the various syruping, filling and crowning units in such a manner that the process of filling and crowning may be carried on with a minimum of floor space and in the minimum time.

For the purpose of disclosing my invention, I have illustrated one embodiment thereof in the accompanying drawings, in which:

Fig. 1 is a vertical sectional view of a device embodying my invention;

Fig. 2 is a section substantially along the line 2—2 of Fig. 1;

Fig. 3 is a plan view of the bottle feeding mechanism; and

Fig. 4 is a detailed view of a portion of the bottle feeding mechanism.

In the embodiment of the invention illustrated I provide a base 1 upon which a syruping and crowning mechanism A is mounted and upon which the liquid filling mechanism B is arranged.

The syruping and crowning mechanism consists of a housing 2 mounted on the base and provided with a supporting partition 3. A cylinder 4 having an annular flange 5 is bolted to the partition 3 and extends upwardly therefrom. A piston 6 is slidably mounted in the cylinder 4 and is provided with a connecting rod 7 pivotally connected to a pin 8. A syruping unit 9 is supported by one end of the pin 8 and a crowning unit 10 is supported by the other end of the pin 8.

A collar 11 is disposed concentric with the cylinder 4 and is secured in place on said cylinder. The cylinder 4 and the collar 11 are provided with elongated slots or openings 12 and 13 for allowing vertical movement of the pin 8 in the cylinder 4 and these openings are maintained closed by a sleeve 14 surrounding the sleeve 11 and reciprocating with the units 9 and 10. A connecting rod 15 is provided with portions 16 and 17 which are adjustably secured to each other by means of a hand operated adjusting member 18 which is arranged to be locked in adjusted position by means of a lock nut 19. The portion 16 is provided with right hand threads 20 and the portion 17 is provided with left hand threads 21. The upper end of the connecting rod is pivotally connected to the piston 6 at 22 and the lower end of the rod is secured to a crank shaft 23.

This crank shaft is mounted in bearings 24 in turn mounted upon the base 1. A drive gear 25 is rigidly secured to the crank shaft 23 and is operatively connected to a drive motor 26 by means of a chain drive 27.

An intermittently operated bottle moving star wheel 28 is disposed concentric with the cylinder 4 adjacent the top 29 of the housing 2 and this star wheel is rigidly secured to an intermittently operated actuating wheel 30 positioned beneath the top 29 and within the housing 2. This actuating wheel is provided with a plurality of slots 31 arranged to receive actuating rollers 32 mounted upon a rotating drive member 33. This drive member 33 is keyed upon a shaft 34 which is supported by bearings 35 and is provided at its lower end with a gear 36 meshing with a gear 37 in turn keyed to a shaft 38 having secured at its upper end a continuously rotating bottle moving star wheel 39. The gear 37 meshes with a gear 40 driven from the shaft 23 by means of a ring gear 41 and a pinion 42.

The liquid filling mechanism B is provided with a vertical stationary shaft 43 rigidly mounted upon the base 1 by means of an annular flange 44. The rotatable drum 45 is disposed concentric with the shaft 43 and is arranged to be rotated with respect thereto. A head portion 46 is secured to the drum 45 and is supported, together with the drum, upon a bearing 47 carried by the shaft 43. This shaft 43 is driven by a gear 48 rotating with the ring gear 41 on the shaft 49, the gear 48 having the ring gear 41 secured thereto by means of bolts 50. This gear 48 meshes with the gear 51 secured to the lower portion of the drum 45. By this arrangement the liquid filling mechanism is driven in unison with

the syrup filling mechanism and crowning device.

A plurality of bottle rests 52 carried by the drum 45 is supported by actuating rods 53. These bottle rests are provided with back portions 54 having outwardly extending interval arms 55 for embracing the bottle and maintaining the same in a vertical position. Each bottle rest is provided with an outer sleeve 56 disposed in supporting bearings 57 integral with the drum 45 and adapted to telescope inner sleeves 58 likewise mounted on the drum. The rods 53 at their lower ends are received and guided in guide portions 59 on the drums 45 and compression springs surrounding the rods 53 and inclosed by the sleeves 56 and 58 bias the supports 52 toward a raised position, the rods and supports 52 being moved to their lower position by means of cam rollers 61 carried on the lower ends of the rods and adapted, at predetermined points in the rotation of the drum 45, to engage a stationary cam 62. This cam is mounted on the housing 2 and is so disposed that as the supports 52 approach the star wheel 39 the supports are moved to their lower position and as they pass away from the star wheel the supports are allowed to move upwardly into bottle filling position.

An adjusting screw sleeve 68 extends through the head portion 46 and is reciprocable in the shaft portion 43. This adjusting screw rotates with the drum 45 through the medium of a key held in position by locking screws 69. A cover 70 is disposed upon the head portion 46 and is provided with an internal threaded opening arranged to receive the threads of the adjusting screw 68. A hand wheel 71 is keyed to the cover 70 for a purpose more fully hereinafter described.

A support 72 is mounted upon the upper end of the adjusting screw 68 and this support carries a filling tank 73 from which the liquid is delivered for filling the bottles. This tank is provided with a liquid supply pipe 74 extending through the adjusting screw 68 through the shaft 43, the base 1 and to, the water-supply compartment 75 of the carbonator 76. A gas line 77 provides communication between the gas tank 78 of the carbonator and the filling tank 73 through a valve 79.

A plurality of filling valves 81 are disposed around the peripheral edge of the support 72 in alignment with the bottle supporting rests 52 and in such relation thereto that as the bottle is raised beneath the same it will receive the liquid and gas from the filling tank.

The star wheel 39 is provided with sets of fingers which are positioned above and below the projections on the bottle moving star wheel 28.

An endless conveyor belt 82 is disposed adjacent the housing 2 so that the upper surface thereof is in a plane with the upper surface of the top 29. This belt is driven from a conveyor shaft 83 mounted in the housing 2 and provided with a bevel gear 84 adapted to mesh with the bevel gear 85 on the shaft 34. This shaft 83 is provided with a sprocket wheel 86 which meshes with the endless chain 87 of the conveyor belt 82.

Guides 89 and 90 are disposed on each side of the conveyor 82 and the guide 90 is provided with a transversely extending portion 91 for a purpose more fully hereinafter described. Arcuate shaped adjustable guides 92 and 93 are positioned a short distance from the bottle feeding wheel 28 on the top 29 and the guide 93 is provided with a transversely extending portion 94. Additional adjustable guides 95 are mounted on the top 29 adjacent the star wheel 39.

An accumulating table 96 is disposed at one end of the conveyor 82 and is positioned on each side thereof being provided with a dividing head 97, the rounded nose 98 of which lies intermediate of the sides of the conveyor belt so that, the two sides 99 and 100 of the divider head shift the bottles off of the conveyor onto the accumulating table.

In operation the conveyor feeds from left to right. The bottles will pass onto the conveyor on the left hand side and as they are carried forward by the conveyor they strike the guide 90 by which they are deflected into the path of the intermittently operated star wheel 28 by which they are picked up, in the pocket thereof, and fed around between the star wheel and the guide 93. The star wheel 39 having its fingers overlapping the wheel 28, the fingers pick up the bottle from the wheel 28 and as the star wheel 28 rotates feed the bottle onto a bottle support 52. As the drum 45 rotates, it carries with it the supported bottle on the support 52 and as the rollers pass beneath the cam 62 the bottle is raised to filling engagement with the filling valve 81. During a pause in its travel with the star wheel 28 the bottle occupies a position immediately beneath the syruping unit 9 which descends and deposits a predetermined quantity of syrup in the bottle so that, when the bottle is moved into cooperative relation with the filling valve 81 it is ready to receive the carbonated liquid from the filling machine A. The continued movement of the filling machine A finally brings the bottle to a point where it will be picked off the support 52 by the fingers of the star wheel 39 and moves onto the top 29 between the star wheel and the guide 95. As it is moved forward by the star wheel 39, the bottle is picked up by the star wheel 28 and positioned beneath the crowning unit 10 which descends and crowns the bottle. After the crowning unit is operated the bottle is moved forward by the star wheel 28 until it is finally again disposed on the conveyor 82, by

which it will be fed to the accumulating table 96, being deflected from the conveyor by the divider head 97.

It will be noted that all of the parts of the above mechanism operate in unison in their step by step movement so that, a continuous stream of bottles is being passed through the device. At the same time that a bottle is being syruped another bottle is being filled with liquid and a third bottle is being crowned.

The present application is a continuation for so much as is disclosed therein of my co-pending application for bottle feeding mechanism, filed June 15, 1928, Serial No. 285,723.

I claim the following:

1. A device of the type described comprising a simultaneous reciprocating syruping unit and crowning unit, means for simultaneously positioning bottles beneath said syruping unit and crowning unit, a filling unit having bottle supporting means and means for receiving a bottle from said positioning means after it has been syruped and depositing it on a support means of the filling machine and removing a bottle from a supporting means of the filling machine and delivering it to said positioning means for positioning beneath said crowning unit.

2. A device of the type described comprising simultaneously reciprocating syruping and crowning units, a bottle filling unit having bottle supports, simultaneously operated means for feeding the bottles to the syruping unit removing the bottles from said syruping unit and feeding the same to said filling unit removing the bottles from said filling unit and feeding the same to said crowning unit.

3. A device of the type described comprising a syruping unit, a crowning unit, a supporting member for supporting said syruping unit and said crowning unit, means for imparting a reciprocatory movement to said supporting member whereby said syruping unit and said crowning unit may be actuated in unison, a rotating filling unit having bottle supporting means, a bottle positioning member for positioning the bottles beneath said syruping unit and crowning unit and means for receiving the bottles from said positioning means and delivering them to the supports of said filling unit and removing the bottles from said filling unit supports and delivering them to said positioning means.

4. A device of the type described comprising a syruping unit, a crowning unit, and a filling unit including bottle supporting members, a supporting member for said syruping and crowning units, means for imparting a reciprocatory movement to said supporting member whereby said supporting and crowning units may be actuated in unison, a bottle positioning means for positioning the bottles beneath said syruping and crowning units, means for receiving the bottles from said positioning means after they have been syruped and delivering the same to the support of said filling unit and for removing the bottles from said support and delivering the same to said positioning means for positioning beneath the crowning unit and means for delivering the empty bottles to said positioning means and receiving the crowned bottles from said positioning means.

5. A device of the type described comprising a syruping unit, a crowning unit, a supporting member for supporting said syruping unit and said crowning unit, means for imparting a reciprocatory movement to said supporting member whereby said syruping unit and crowning unit may be actuated in unison, a filling unit including bottle supporting means, and bottle feeding means including means for delivering the bottles to the syruping unit, removing the bottles from the syruping unit and delivering the same to the filling unit, removing the bottles from the filling unit and delivering the same to the crowning unit and finally removing the bottles from said crowning unit.

6. In a device of the type described, the combination with a syruping unit, a crowning unit and a filling unit including bottle supporting members, a common positioning means for said syruping unit and said crowning unit, a conveyor for delivering the bottle to said positioning means and receiving the same from said positioning means and means for removing the bottles from said positioning means and delivering them to the supports of said filling unit and removing the bottles from said supports and again delivering them to the positioning means.

7. In a device of the type described, the combination with a table support, of a hollow standard extending vertically above said support, a sleeve surrounding said standard, a bottle crowning unit and a bottle syruping unit mounted at diametrically opposite points on said sleeve, a rod connected to said sleeve and arranged within said standard and means beneath said support for reciprocating said rod.

8. In a device of the character described, the combination with a base, of a hollow standard extending upwardly from said base, a sleeve surrounding said standard, a bottle crowning unit and a bottle syruping unit mounted at diametrically opposite points on said sleeve, a wrist pin extending through said standard and connected to said sleeve, a piston rod connected to said wrist pin and a crank mounted beneath said support and connected to said piston rod.

9. In a device of the character described, the combination with a base or support, of a hollow standard extending vertically from said base or support, a sleeve surrounding

said standard, a bottle crowning unit and a bottle syruping unit mounted on said sleeve at diametrically opposite points, a reciprocating rod arranged within said standard and connected to said sleeve, an operating crank beneath said support and an adjustable connection between said rod and crank.

10. In a device of the character described, the combination with a base or support, of a hollow standard extending vertically from said support, a sleeve surrounding said support, a bottle crowning unit and a bottle syruping unit mounted on said sleeve at diametrically opposite points, a reciprocating rod arranged within said standard and connected to said sleeve, means for reciprocating said rod, and a rotating star wheel surrounding said standard and arranged to receive and pass bottles respectively beneath said crowning unit and said syruping unit.

11. A device of the type described comprising a plurality of bottle supporting members arranged to be moved in a circular path, an intermittently moving star wheel, and a continuously rotating star wheel disposed between said bottle supporting members and said intermittently moving star wheel, and arranged to remove bottles from said intermittently moving star wheel and deliver the same to said supporting members and remove bottles from said supporting members and deliver the same to said star wheel.

12. A device of the type described comprising an intermittently moving star wheel, a conveyor for delivering bottles to said star wheel, a plurality of bottle supporting members arranged to move in a circular path, a rotating star wheel disposed between said intermittently moving star wheel and the bottle supporting members and arranged to remove bottles from said intermittently moving star wheel and deposit them on said supporting members and to remove bottles from said supporting members and deliver the same to said star wheel.

13. A device of the type described comprising a plurality of bottle supporting members arranged to move in a circular path, an intermittently moving star wheel, guide means adjacent said star wheel for confining the bottles between the fingers of said star wheel, and a rotating star wheel disposed between said bottle supporting members and said intermittently moving star wheel and arranged to remove the bottles from said intermittently moving star wheel and deliver the same to said bottle supporting members and remove the bottles from said bottle supporting members and deliver the same to said intermittently moving star wheel.

14. A device of the type described, the combination with an intermittently moving star wheel, of conveying means for delivering the bottles to and receiving the bottles from said intermittently moving star wheel, a plurality of bottle supporting members arranged to move in a circular path, and a rotating star wheel disposed between said bottle supporting members and said intermittently moving star wheel and arranged to remove the bottles from said intermittently moving star wheel and deliver the same to said supporting members and to remove the same from said supporting members and deliver the same to said intermittently moving star wheel.

15. In a device of the type described, the combination with a plurality of bottle supporting members rotatable in a circular path, of an intermittently rotating star wheel, a second rotating star wheel disposed between said intermittently moving star wheel and the bottle supporting members and arranged to receive the bottles from one side of the center of said intermittently moving star wheel and delivering them to the bottle supporting members and receive the bottles from said bottle supporting members and deliver them to the opposite side of the center of said intermittently moving star wheel.

16. In a device of the character described, the combination with a plurality of bottle supporting members arranged to be moved in a circular path, of an intermittently moving star wheel, a rotating star wheel having fingers overlapping the fingers of the intermittently moving star wheel and the bottle supporting members and arranged to engage the bottles moved by said intermittently moving star wheel and move them to the supporting members and engage the bottles on the supporting members and move them into the path of the fingers of the intermittently moving star wheel.

17. A device of the type described comprising an intermittently rotating star wheel, means for moving bottles into registration with said rotating star wheel, a second rotating star wheel, means whereby said second star wheel may remove the bottles from said intermittently rotating star wheel, and a plurality of individual bottle-supporting members arranged to be moved in a circuitous path adjacent said second star wheel, said second star wheel being arranged to move said bottles upon said bottle-supporting members and arranged to remove said bottles from said bottle-supporting members after they have moved through a circuitous path.

In witness whereof, I JAMES KANTOR have hereunto set my hand at Chicago, Illinois, this 8 day of March, A. D. one thousand nine hundred and thirty.

JAMES KANTOR.