June 14, 1932. J. KANTOR 1,863,223

BOTTLE CROWNING MACHINE

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Fig. 1.

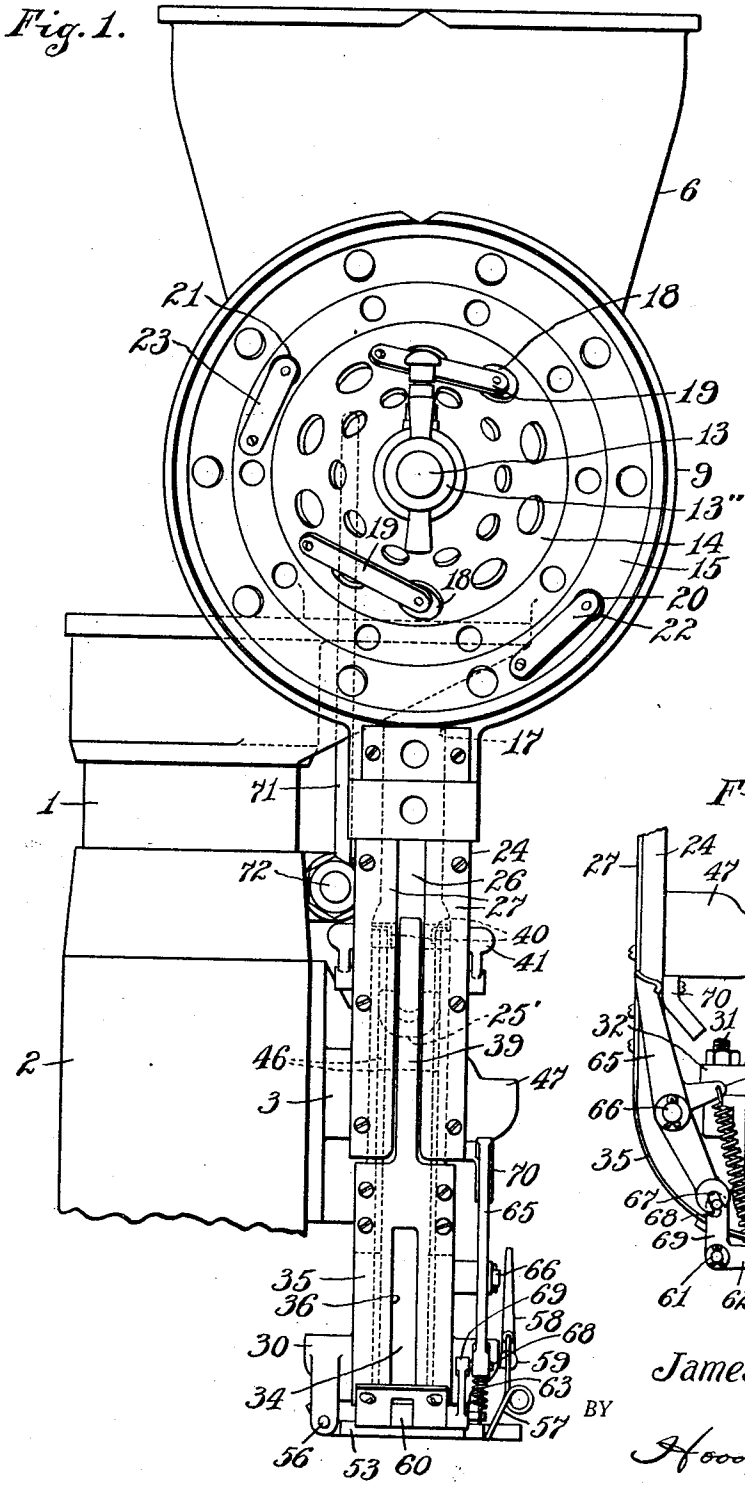
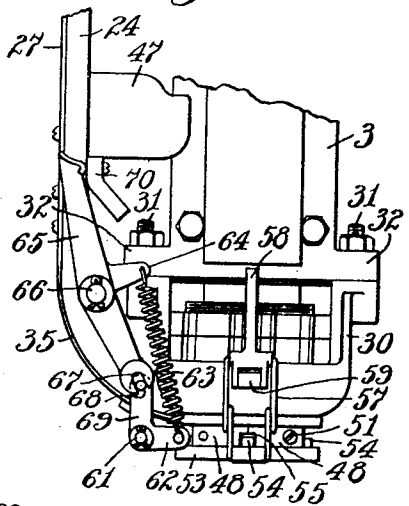


Fig. 3.



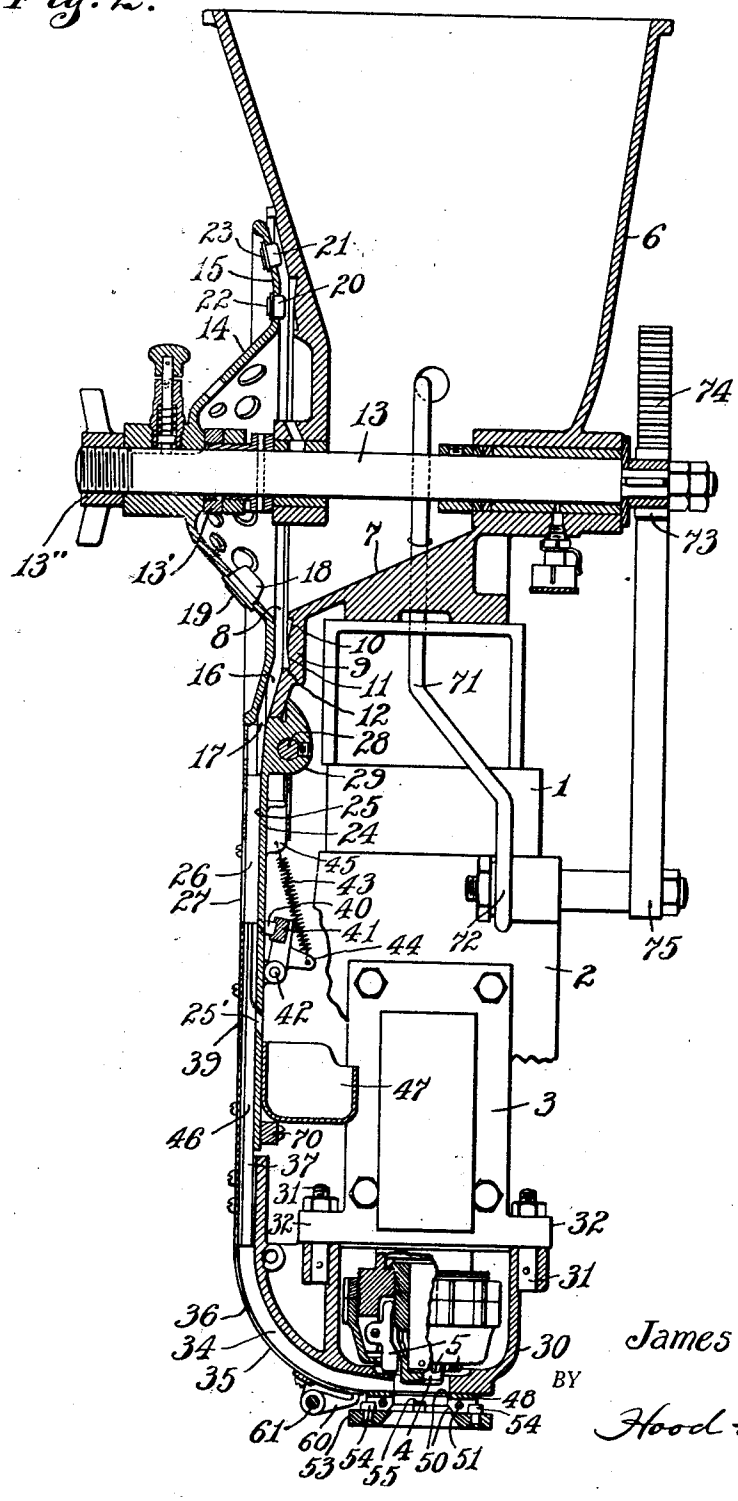
INVENTOR.
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Fig. 2.



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Fig. 5.

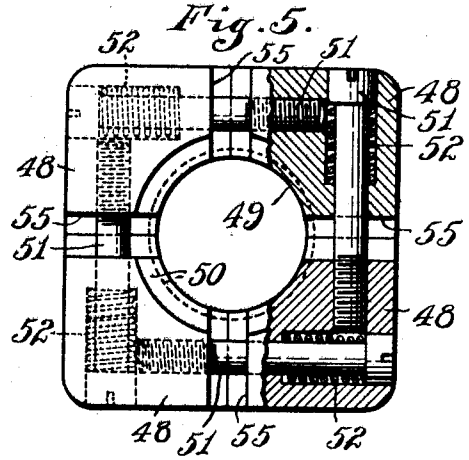


Fig. 4.

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Patented June 14, 1932 1,863,223

UNITED STATES PATENT OFFICE

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

BOTTLE CROWNING MACHINE

Application filed March 1, 1930. Serial No. 432,304.

My invention relates to improvements in crowning mechanism and has for one of its objects the provision of improved means for insuring the proper delivery of the crowns to the bottles to be crowned.

Another object of my invention is to provide improved means for preventing the crowns from jamming in the hopper of the crown feeding mechanism.

Another object of my invention is to provide an improved crown feeding chute, and still another object of my invention is to provide an improved form of crown holding means for positioning the crown relatively to the bottle.

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

Fig. 1 is a front elevation of a crowning mechanism embodying my invention;

Fig. 2 is a longitudinal sectional view thereof;

Fig. 3 is a detailed side elevation of the lower end of the crowning mechanism;

Fig. 4 is a detailed section of the movable chute section; and

Fig. 5 is a plan of the crown holder.

In carrying out my invention, I provide a vertically extending stationary supporting standard 1, on which is slidably mounted a sleeve or reciprocating member 2 adapted to carry and move the crowning unit 3 which, with the sleeve, has a reciprocating movement. This crowning unit is fully disclosed in my copending application, Serial No. 285,629, filed the 15th day of June, 1928, and in general comprises the crowning plunger 4 cooperating with a plurality of crown crimping fingers 5 adapted by the reciprocation of the plunger to be moved into crimping engagement with the crown after the same has been placed upon the bottle.

Supported from the stationary head 1 is a crown hopper 6, the bottom 7 of which slopes toward a delivery opening 8. Surrounding the delivery opening 8 is a flange 9 having formed in the face thereof an annular channel of peculiar configuration. The bottom of this channel inclines outwardly as at 10 to a medial point and then inwardly as at 11 forming a shoulder 12 in the outer periphery of the flange. The purpose and advantage of this configuration will appear more fully hereinafter.

A shaft 13 extends through the hopper, having bearings in the walls thereof and has rotatable therewith a disk 14 having a rim 15 shaped to conform to the flange 9 to leave a throat 16 between the disk and the flange. The width of this throat may be varied by adjusting the disk 14 on the shaft 13 by the manipulation of the set nuts 13′ and 13″. The channel in the flange 9 meets a vertical channel 17 which communicates with the crown chute leading to the crowning mechanism. The disk 14 is provided with a pair of agitators 18 spring pressed by means of the flat springs 19 on the outer face of the disk and with the agitators 20 and 21, likewise spring pressed by flat springs 22 and 23. The agitator 20 serves the purpose of moving a crown around the channel in the flange 9 when the same fails to feed on down into the crown chute. It is necessary for the positioning of the crowns that they feed into the chute with the cork side out. If by any chance a crown drops from the hopper into the chute with the cork side in, the edge of the crown will strike the face of the rim 15, tilting inwardly and causing the edge to catch on the shoulder 12, which prevents the crown from feeding into the chute. As the agitator 20 moves around the channel with the rotation of the disk 14, it will engage the crown, thus caught, and move the same around the channel until it reaches the upper portion of the channel where it will drop back into position for feeding again. Supported from the hopper 6 and in juxtaposition to the delivery mouth 17 thereof is a stationary portion 24 of a crown chute. This stationary portion preferably comprises a back member 25 having a front channel 26 formed in the face thereof of a size to accommodate the crowns, and provided with guide plates 27. The stationary portion is supported from the hopper by means of pivot pins 28, extending through a lug 29, on the rear of the chute and through suitable supporting lugs on the hopper.

Cooperating with the stationary chute section is a movable chute section including the cup shaped portion 30 adapted to receive the crowning head, and which is secured to the crowning unit 3 by means of bolts 31 extending through lugs 32 on the crowning unit. This cup 30 is provided on its outer face with a groove 34 which is curved from the vertical to the horizontal, so that as the crowns feed therein they eventually are positioned horizontally above the bottle to be crowned. This groove 34 is of sufficient width to accommodate the crowns and is provided on its face with a guide plate 35 having a central slot 36. The grooved chute is extended upwardly at 37 to meet with the bottom of the stationary chute, and the cover plate 35 has a central projecting finger 39 sliding between the two plates 27.

Due to the fact that the movable section of the crown chute moves with the crowning unit 3 there is a relative movement between the two sections of the chute and to prevent the downward movement of the crowns in the stationary portion of the chute during the downward movement of the movable portion, I provide a stop member in the form of fingers 40. These fingers are mounted on a rock bar 41 pivoted at 42 to the rear of the stationary portion of the chute and the fingers are adapted to project through the rear of the chute into the path of the crowns. These fingers are normally projected into the path of the crowns by the coiled spring 43, one end of which is connected to a lever arm 44 and the opposite end to a portion 45 of the crown chute. When, however, the movable portion of the chute is raised, the fingers are moved out of the path of the crowns by means of vertically movable guides 46 carried by the movable portion of the chute and adapted to engage the fingers 40 and push the same out of the path of the crowns. These guides in effect constitute an extension of the movable chute section telescoping the stationary chute section and the crowns feed between and are guided by these guides into the groove 34.

The rear plate 25 near its lower end is provided with an arcuate opening 25′ which is of such shape and arrangement that if, by any chance, a crown passes through the throat 16 with the cork side in, its edge, facing such opening, will be caught, and the crown will be guided through said opening 25′ out of the chute before it reaches the crowning position. Immediately beneath this opening there is provided a cup or receptacle 47 for receiving those crowns which have been discharged through the opening 25′.

The crown chute terminates at its bottom in a crown holder which comprises four sections 48 substantially rectangular in shape and each of which at one corner is provided with an arcuate recess 49 having the edges chamfered off as at 50. The four sections 48 when assembled thus form a rectangular plate having a central opening therein of sufficient size to receive the bottle neck. These four plates are connected together by bolts 51 around which are arranged coiled springs 52, the construction being such that the springs bias the plates toward one another while permitting a separation of the plates in event a bottle neck of unusual size is forced through the opening. This crown holder is carried on a supporting member 53 having extending upwardly therefrom a plurality of pins 54 operating in grooves 55 on the under face of the quadrants of the crown holder. This support 53 is hingedly mounted at 56 to the cup 30, on one side and on the other side is supported by a spring latch 57, one end of which is connected to a lever 58 pivoted at 59 whereby when the lever is dropped the end of the support 53 may be dropped to permit the removal or adjustment of the crown holder.

As the crowns are fed down the crown chute a crown is placed on the holder and in a position to receive the top of the bottle neck. As there is a relative movement between this crown and the next succeeding crown in the chute, it is desirable that these two crowns should not be in contact, therefore, in order to move the next succeeding crown slightly backward in the chute and out of contact with the positioned crown, I provide an oscillating finger 60 pivoted at 61 to the crown chute and adapted when rocked to project into the chute and engage the crown therein to move the same slightly rearwardly. This finger 60 is connected to a bell crank lever mounted on the same pivot 61 and having one arm 62 thereof connected with a coiled spring 63, the opposite end of which is connected to an arm 64 projecting from a rocking cam lever 65 pivoted at 66. The lower end of this lever is slotted at 67 to receive a pin 68 on the other bell crank arm 69. The upper end of this lever is adapted to contact with a cam member 70 mounted on the stationary portion of the crown chute and in such a position that when the movable portion of the crown chute is in its elevated position the finger 60 is retracted from the crown chute slot, but when the movable portion of the crown chute is in its lower position the coiled spring will rock the finger 60 into engagement with the crown and slightly retract the same.

There is a tendency on the part of the crowns in the hopper 6 to bridge across the narrow portion of the hopper, due to jamming, etc., of the crowns. To agitate the crowns and prevent this bridging, I provide a reciprocating finger 71 which is connected at 72 to the sliding sleeve 2 and reciprocates therewith, so that during the reciprocating movement of the crowning unit this finger

will be moved up and down in the hopper to agitate the crowns.

For the purpose of oscillating the shaft 13 and with it the disc 14, one end of this shaft is provided with a pinion 73 meshing with a rack 74 connected at its lower end at 75 to the sleeve 2 so that the reciprocating movement of the rack will impart an oscillating movement to the shaft.

In operation the hopper 6 is filled with crowns which feed by gravity down through the throat 16 and into the crown chute filling the chute and depositing one crown on the crown supporting plate. When the crowning unit is moved downwardly to cause the bottle neck to pass through the opening in the crown holder and receive the crown, this downward movement operates the crimping levers 5 to crimp the crown on the bottle. During this downward movement of the crowning unit the finger 60 is oscillated to engage the next succeeding crown in the chute to slightly retract this crown out of engagement with the one on the bottle. This downward movement of the crowning unit also causes a downward movement of the movable section of the chute thereby separating the two sections, but due to the fact that as the movable section drops, the guide fingers 46 are retracted from in front of the fingers 40, these fingers will project into the path of the crowns in the stationary section preventing them from moving downwardly. At the same time that the crowning unit is moved downwardly the shaft 13 is rotated in one direction rotating the disk 14, and the agitator finger 71 is lowered. The upward movement of the crowning unit clears the unit from the bottle. This upward movement oscillates the disk 14 in the opposite direction and also moves the agitating finger 71 upwardly thereby keeping the crowns agitated and preventing any bridging of the same in the hopper. Also the upward movement of the crown unit raises the movable section of the chute to its initial position and at the same time moves the fingers 40 out of the path of the crowns in the stationary section of the chute permitting the crowns to drop down a distance equal to the width of one crown so that a new crown will be deposited on the supporting plate.

The upward movement of the movable chute section carries with it the lever 65 causing the same to engage the cam 70 thus rocking the finger 60 out of engagement with the lowermost crown in the chute and permitting this crown to be moved by gravity onto the crown holder.

I claim the following:

1. In a device of the character described, the combination with a reciprocating crowning unit, of a crown hopper, a crown chute for receiving the crowns from the hopper and delivering them to the crown unit, said chute comprising a stationary portion and a portion connected to and movable with the crowning unit, an arm pivoted to the exterior of the stationary portion of said chute, a pair of spaced fingers carried by said arm, said stationary chute portion being provided with apertures aligned with said fingers, and means associated with said arm and resiliently urging said fingers to enter said chute portion, said fingers, when so entered, obstructing movement of crowns in said chute portion.

2. In a device of the character described, the combination with a reciprocating crowning unit, of a crown hopper, a crown chute for receiving the crowns from the hopper and delivering them to the crowning unit, said chute comprising a stationary portion and a portion connected to and movable with the crowning unit, said chute being formed, adjacent said unit, with a slot, a pivoted finger movable through and longitudinally in said slot and engageable with a crown in said chute to retract the same, resilient means for effecting crown-retracting movement of said finger, and a cam actuated pivoted lever associated with said finger and operable, upon upward movement of said unit, to overcome the tendency of said resilient means.

3. In a device of the character described, the combination with a reciprocating crowning unit, of a crown hopper, a crown chute for receiving the crowns from the hopper and delivering them to the crowning unit, said chute comprising a stationary portion and a portion connected to and movable with the crowning unit, means for preventing the feeding of the crowns in the stationary portion of the chute during the movement of the movable portion, and means for retracting the crowns in the movable portion upon downward movement of said movable portion.

4. In a device of the character described, the combination with a crowning unit, of a crown hopper, a crown chute for receiving the crowns from the hopper and delivering the same to the crowning unit, said chute comprising a stationary portion associated with the hopper and a movable portion connected to and movable with the crowning unit and telescoping said stationary portion, an arm pivoted to the exterior of the stationary portion of said chute, a pair of spaced fingers carried by said arm, said stationary chute portion being provided with apertures aligned with said fingers, means associated with said arm and resiliently urging said fingers to enter said chute portion, said fingers, when so entered, obstructing movement of crowns in said chute portion, and an element carried by said movable chute portion and engageable with one of said fingers, in one position of said movable portion, to move and hold said fingers out of crown-obstruct-

ing position, said element being always disposed in a non-obstructing position with relation to the crowns in said chute.

5. In a device of the character described, the combination with a crowning unit, of a crown holder associated therewith, comprising four segmental sections, each having a recess in one edge to form, when the sections are associated, a bottle neck receiving opening, independent means resiliently connecting each of said sections to each adjacent section, and a crown chute for delivering crowns to said holder.

6. In a device of the character described, the combination with a crowning unit, of a crown holder comprising four plates, each having an arcuate recess in its edge which, when the plates are associated, form an opening in the holder for the passage of a bottle neck, each of said plates being formed with a counterbored bore therethrough, and with a tapped hole therein perpendicular to said bore, a headed bolt passing through the bore of each plate and threaded into the hole in an adjacent plate, and a coiled spring sleeved on each of said bolts and bearing at one end against the bolt head and at its other end against the bottom of the counterbore.

7. In a device of the character described, the combination with a crowning unit, of a support carried thereby, a crown holder mounted on said support and comprising four plates each having an arcuate recess in one of its edges to form, when the plates are associated, an opening in the holder for the passage of a bottle neck, independent means resiliently connecting each of said plates to each adjacent plate, each of said plates being formed in its base with a slot, and a plurality of pins rigid on said support, each of said pins entering one of said slots, whereby said plates are guided in their sliding movement on said support.

In witness whereof, I, JAMES KANTOR, have hereunto set my hand at Chicago, Illinois, this 25 day of February, A. D. one thousand nine hundred and thirty.

JAMES KANTOR.