Oct. 3, 1944. J. KANTOR 2,359,561

CROWN REST

Filed April 12, 1943

Fig. 1.

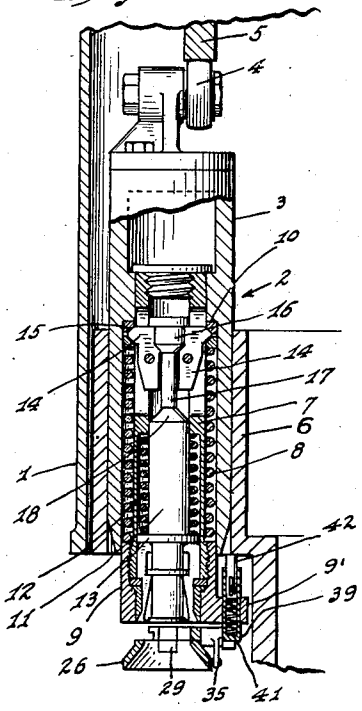


Fig. 5.

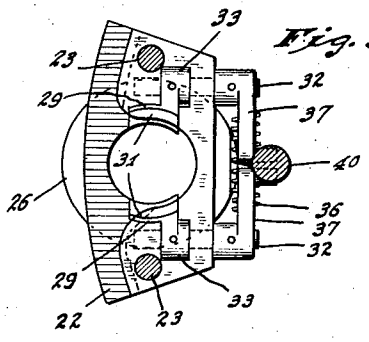


Fig. 4.

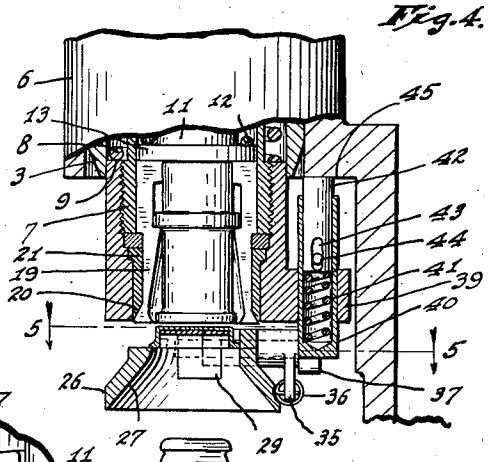
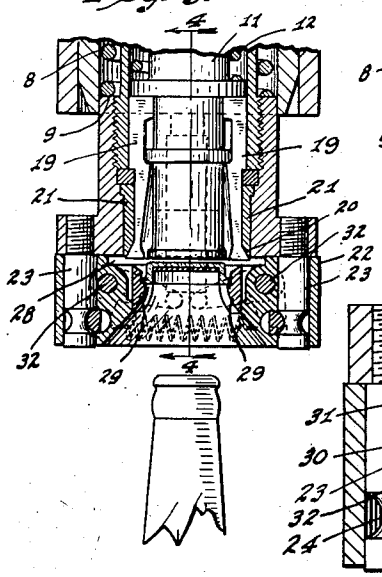


Fig. 3.



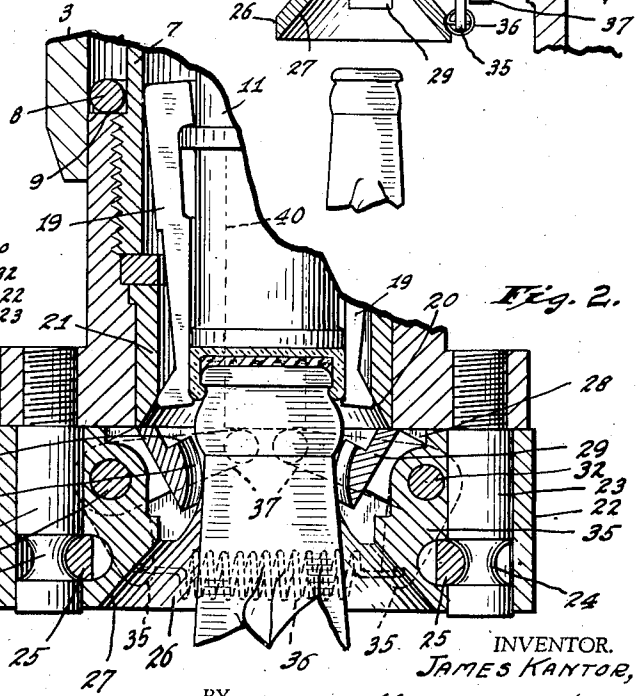


Fig. 2.

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CROWN REST

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Application April 12, 1943, Serial No. 482,664

6 Claims. (Cl. 226—86)

The present invention relates to improvements in apparatus for applying crowns to containers, particularly bottles and the like.

One of the principal objects of the invention is to provide a crown rest for use in connection with crowning apparatus adapted to handle the so-called type of plastic crowns which are now being used instead of the metal type of crown heretofore used in the industry.

As a result of the different type of crown, of the plastic type, it is necessary to provide a crown rest giving greater clearance to the crown and to the bottle neck. On the other hand, it is necessary to provide a crown rest having a suitable diameter when the crown is delivered to the rest to support the crown in a position to receive the bottle as the bottle and crowning mechanism approach one another.

For the purpose of disclosing my invention, I have illustrated an embodiment thereof in the accompanying drawing, in which

Fig. 1 is a longitudinal sectional view of so much of the crowning mechanism as is necessary for illustrating my invention;

Fig. 2 is an enlarged longitudinal sectional view showing more in detail my improved crown rest, the parts being shown with the container in a position for the crown to be applied thereto;

Fig. 3 is a similar view to Fig. 2, showing the crown rest and the crown in a receiving position and a crown supported thereby;

Fig. 4 is a longitudinal sectional view on the line 4—4 of Fig. 3, showing the mechanism for moving the crown rest in position; and

Fig. 5 is a transverse sectional view on the line 5—5 of Fig. 4.

In the embodiment of the invention illustrated, I provide a stationary housing 1 which is more or less of standard commercial form and which housing is provided with a plurality of crowners 2 each of which is the same construction. Each of the crowners, as it is moved in position over the receptacle to be crowned, due to its rotary movement, is adapted to place a crown on the receptacle. Each of the crowning heads 2 comprises a hollow cylindrical housing 3 carrying, at its upper end, a roller 4 adapted to engage a cam 5, stationarily mounted, for vertically reciprocating the housing 3. The housing 3 operates in a relatively stationary sleeve 6 and carries the mechanism for applying the crown to the bottle, including the crown rest. Within this housing is arranged a hollow sleeve 7 adapted to be moved into its projected position by a coiled spring 8 interposed between a shoulder of a collar 9 threaded on the lower end of the sleeve and a shoulder 10 within the housing 3. Within this sleeve is arranged a plunger 11 adapted to be moved into a projected position by a coiled spring 12 bearing, at one end, on an anular flange 13 on the plunger and, at its other end, on a shoulder of the sleeve 7. The sleeve 7 is maintained in its retracted position through the medium of a pair of dogs 14 pivoted within a slot in the sleeve 7 and adapted to engage, when in holding position, in a V-groove 15 in a ring mounted within the housing 3. The dogs 14, in holding position, engage beneath a head 16 on a narrowed neck 17 of the plunger 11 and at the lower end of this neck 17 is a cam shoulder 18.

The crown, after having been deposited on the mouth of the bottle, is crimped around the bead of the bottle by a series of crimping fingers 19 which surround the lower end of the plunger and, after the crown is in position on the bottle, are adapted to be moved into crimping position beneath the skirt of the crown through the medium of a cam 20 on the lower end of sleeve 21 held within the collar 9.

The crown rest 22 may be a separate entity and is supported upon a pair of downwardly extending pins 23 screwed into ears on the collar 9 and provided, at their lower ends, with notches or recesses 24. These pins project through the openings in the crown rest 22 and are engaged by cross pins 25 notched on one side to provide, when in releasing position, a clearance for the pins 23. However, when these cross pins 25 are rotated into engaging position, they engage in the grooves 24 and thus lock the crown rest in position.

This crown rest is provided with a bottle accommodating, or bottle receiving, opening 26 flared, as at 27, for the guidance of the bottle as it projects through the opening, and, on its upper face, the crown rest 22 is provided with a recess 28 providing an opening between the crown rest and the collar 9 for the passage thereinto of a crown as it is delivered from the delivery means, preferably in the form of a crown chute.

The crown, when delivered into position, is adapted to be supported on a pair of segmental supports 29 disposed on opposite sides of the opening 26.

Each of these supports or dogs has its front face concave, as at 30, to coincide with the general shape of the neck of the bottle and the front face vertically is arcuate to provide the necessary clearance for the bottle portions. The top of these ears is flattened, as at 31, to provide a

crown rest proper when the ears are in their receiving positions. Each ear is mounted on a rotating shaft 32 journalled in the crown rest 22, the hub 33 of the ear being pinned on this shaft. The outer end of this shaft carries a bell crank lever, the vertical arm 35 of which has connected thereto a tension spring 36, the opposite ends of the spring being connected to the similar bell crank lever arm of the other crown supporting ear. The other arm 37 of the bell crank lever extends substantially horizontally. It is to be noticed that unless the arms 37 are engaged by suitable means for forcing the arms downwardly, the spring 36 will have a tendency to draw the arms 35 together at their lower ends, thus rocking the ears 29 upwardly.

These ears 29 are moved into crown-receiving position by means of a spring pressed plunger supported in an ear 39 on the collar 9. This plunger comprises a hollow section 40 having mounted therein a spring 41 and a plunger rod section 42 fitting within the section 40 and slotted, as at 43, to receive a pin 44 extending through the sleeved section 40. The top of the plunger section 42 is adapted to engage a shoulder 45 on a vertically relatively stationary portion of the crowning head housing 6. When the parts are in crown-receiving position, the plunger 42, due to its engagement with the shoulder 45 through the medium of the spring 41, will force the sleeve section 40 downwardly into engagement with the arms 37 thus rocking the ears 29 into a position where the shoulder 31 is in a horizontal position and in a position to receive a crown as it is delivered to the crown rest.

In operation, as the housing 3 descends, the throat 27 will receive the neck of the bottle and, with a crown in position on the crown rest, the crown will be placed upon the top of the bottle. With the descent of the housing 3, the plunger 11 will engage the top of the crown forcing the same into tight engagement with the top of the bottle, and a continued downward movement of the housing 3 will cause a relative upward movement of the plunger 11, it being borne in mind that the bottle itself is vertically stationary.

Continued relatively upward movement of the plunger 11 with respect to continued relatively downward movement of housing 3 causes the outwardly extended ends of the crimping fingers 19 to be forced inward to a smaller diameter by the cam portion 20, thus tightly molding the softened crown skirt (softened by pre-heat) around the crown locking ring of the bottle. This entire crowning operation is completed before cam shoulder 18 engages the bottoms of the dogs 14 and causes the upper ends of said dogs to disengage V groove 15, thus permitting the entire sleeve 7 assembly freedom to move further upward if necessary. When the dogs 14 disengage, the main crowning pressure is entirely relieved, after which the spring 8 comes into use. The coil spring 8 should not be misinterpreted as forcing sleeve 7 downwardly to cause crimping of the crown, but rather to return the entire sleeve 7 assembly to its lowest position after crimping of the crown is accomplished and dogs 14 are disengaged from the V groove 15. In a sense, the dogs 14 lock the entire sleeve 7 assembly to the housing 3 while the housing is moving down over the bottle during which movement crowning of the bottle is actually done, the sleeve 7 still remaining locked to the housing 3.

As the housing and sleeve assembly moves downwardly it carries with it the plunger comprising the sections 40 and 42 so that the rod 42 thereof is moved away from the shoulder 45 thus releasing the pressure on the plunger and, accordingly, the pressure on the arms 37. This permits the spring 36 to rock the arm 35 inwardly so that by the time the crown skirt is completely crimped around the bead of the bottle, the ears 29 will have been rocked into the position illustrated in Fig. 2. Therefore, sufficient clearance is provided for the reinforced neck of the bottle permitting the same to clear the crown rest as the parts again ascend to clear the crowner from the bottle after the crown has been secured thereon. This clearance is essential in a structure wherein crowns of the heated plastic type are adapted to be used. It is to be noted that the skirt of the crown is relatively thick and therefore the diameter of the crown is somewhat greater than the diameter of the reinforced neck of the bottle. Accordingly, if no provision were made for providing a clearance greater than the diameter of the crown, as the crowner and the bottle are moved apart, the crown support shoulders 31 would again engage the crown, either stripping the same from the bottle or causing the bottle to break. While it is necessary to provide sufficient clearance for the diameter of the crown, it is also necessary to provide guiding means to prevent the bottle, especially the neck thereof, from moving sideways too great an extent.

As the housing 3 moves upwardly carrying with it the crown rest and the sleeve 9, the plunger rod 42 will again come in contact with the shoulder 45 forcing the plunger downwardly and thus rocking the arms 37 back to their horizontal position, against the tension of the spring 36, so that by the time the parts have again come to rest, the crown rest ears will be in a crowning position, the position illustrated in Fig. 3.

It is apparent that spring 41 must be considerably stronger than the spring 36 in view of the fact that the swinging of the arms 37 to a horizontal position against the tension of the spring 36 is effected by the plunger section 40 which, in turn, is moved through the medium of the spring 41.

I claim as my invention:

1. In a crowning machine, in combination, a reciprocating support, a crown rest carried at the lower end of said support having an opening therethrough to permit passage of the receptacle to be crowned through said support, means on said support for supporting a crown in a position to receive the neck of the receptacle as it passes through said support, and means for moving said supporting means to enlarge the opening therethrough to provide a greater clearance for the receptacle as it is withdrawn from said support and maintaining said means in their enlargement position during the withdrawal from said support.

2. In a crowning machine, in combination, a reciprocating support, a crown rest carried at the lower end of said support having an opening therethrough to permit passage of the receptacle to be crowned through said support, crown supporting segments arranged within said opening and having shoulders for supporting a crown thereon in a position to be received by the neck of the receptacle as it passes through said opening, and means for swinging said segments in an arc to provide a greater clearance for the neck of the receptacle as it is removed from the crown

rest opening and maintaining said segments in their swung position during the removal of the receptacle from the crown rest opening.

3. In a crowning machine, in combination, a reciprocating support, a crown rest carried at the lower end of said support having an opening therethrough to permit the passage of the receptacle to be crowned through said support, a plurality of arcuate segments within said opening having shoulders thereon for supporting a crown in a position for application to the receptacle, and means for swinging said segments to a position to provide an increased clearance for the receptacle neck after the crown has been applied to said receptacle and for maintaining said segments in their swung position during the removal of the neck of the receptacle from the crown rest.

4. In a crowning machine, in combination, a reciprocating support, a crown rest carried at the lower end of said support having an opening therethrough to permit the passage of receptacles to be crowned through said support, a plurality of crown rest segments having crown supporting means thereon and within said opening swingable about a horizontal axis to provide an increased clearance for a receptacle neck, means for swinging said segments into receiving position when said support is moved to its retracted position, and means for swinging said segments into a clearance position when said support is moved to projected position and maintaining said segments in their clearance position during the withdrawal of the neck of the receptacle.

5. In a crowning machine, in combination, a reciprocating support, a crown rest carried at the lower end of said support having an opening therethrough to permit the passage of a receptacle to be crowned through said support, means on said support supporting the crown in position to receive the neck of the receptacle as it passes through said support comprising a plurality of segments fitting within said opening, each of said segments having an arcuate shape both horizontally and vertically and having a shoulder at its top for receiving the crown, means for swinging said segments to move said shoulder out of a horizontal position after the crown has been applied to the receptacle, and means for swinging said segments with the shoulder in a horizontal position when the reciprocating support is in its retracted and crown-receiving position and for maintaining said shoulder out of horizontal position during the withdrawal of the neck of the receptacle.

6. In a crowning machine, in combination, a reciprocating support, a crown rest carried at the lower end of said support having an opening therethrough to permit the passage of the receptacle to be crowned through said support, a plurality of crown rest segments arranged within said opening, means for pivotally supporting said segments to swing on a horizontal axis, each of said sections being arcuate both vertically and horizontally, a bell crank lever connected to each of said segments, a spring connecting the depending arms of said levers for biasing them into a rocked position, and means for engaging the other arms of said levers for moving the segments in the opposite direction against the tension of said spring, said means being operated by the reciprocating movement of said support.

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