

May 25, 1937.

W. I. GLADFELTER

2,081,809

BOTTLE CAPPING MACHINE

Original Filed July 29, 1932

4 Sheets-Sheet 1

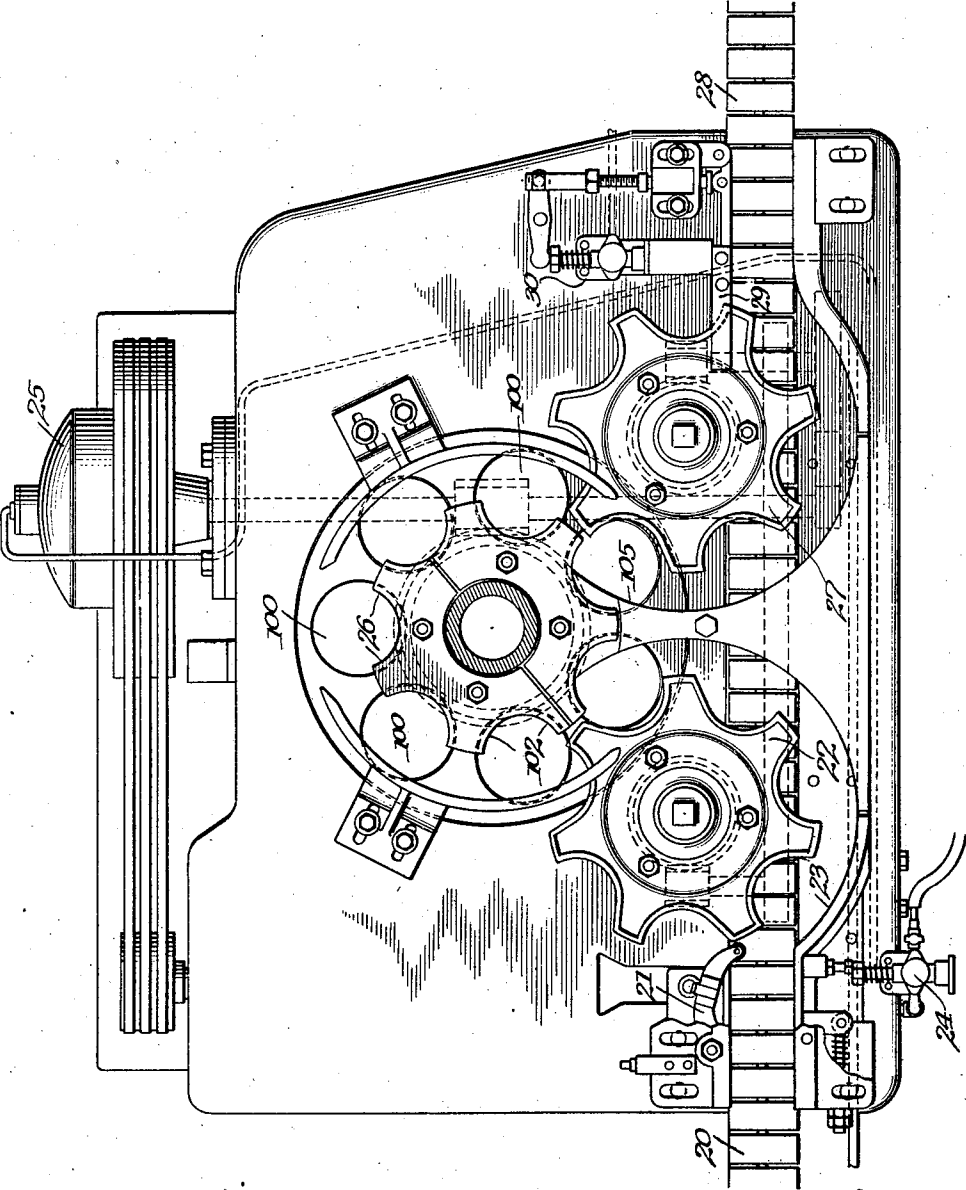


Fig. 1.

Inventor

Willie I. Gladfelter.

By *Arthur D. & Arthur* Attorneys

May 25, 1937.

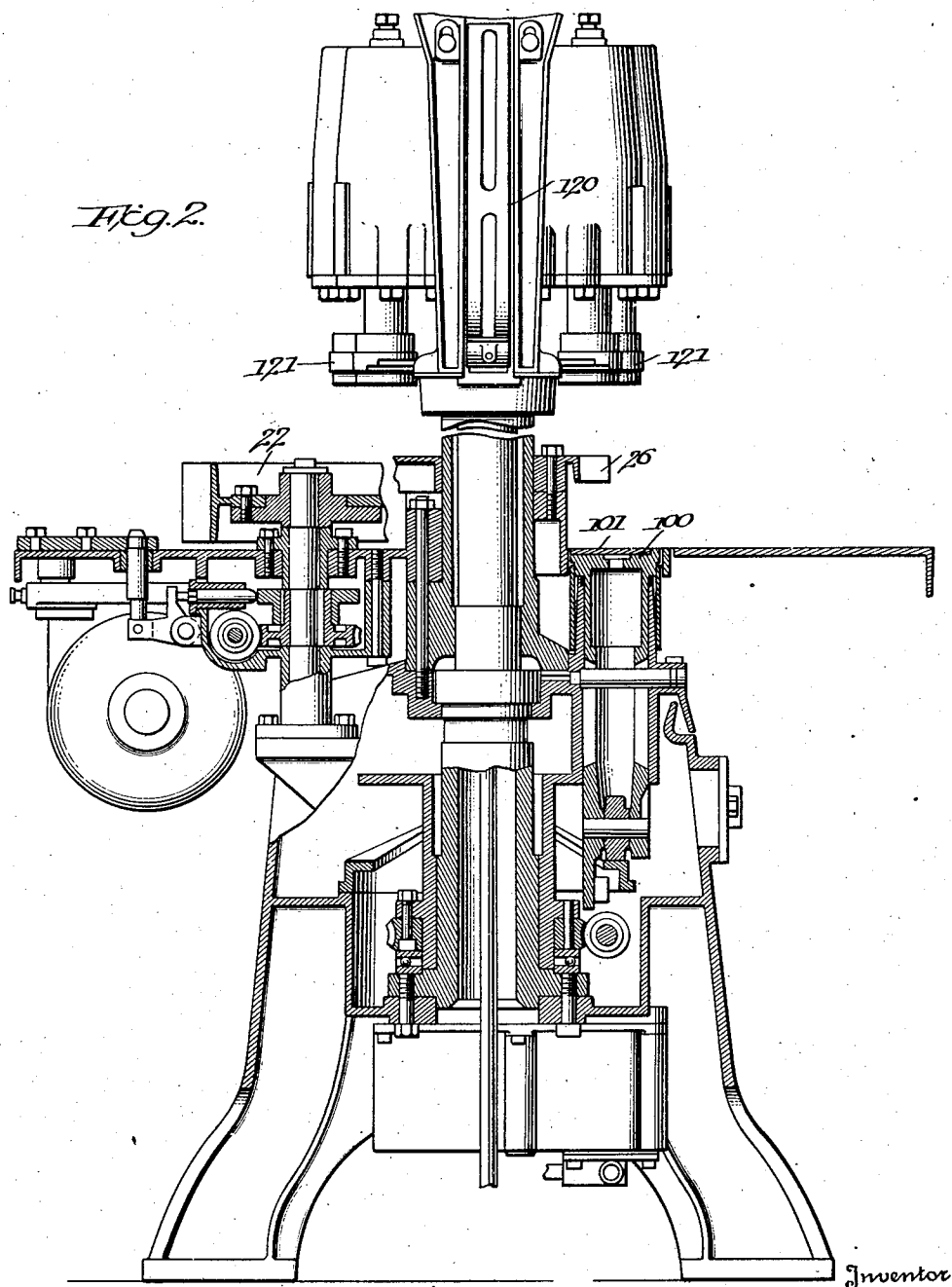
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4 Sheets-Sheet 2



Inventor

Wittie I. Gladfelter.

By *Cushman Kirby & Cushman*
Attorneys

May 25, 1937.

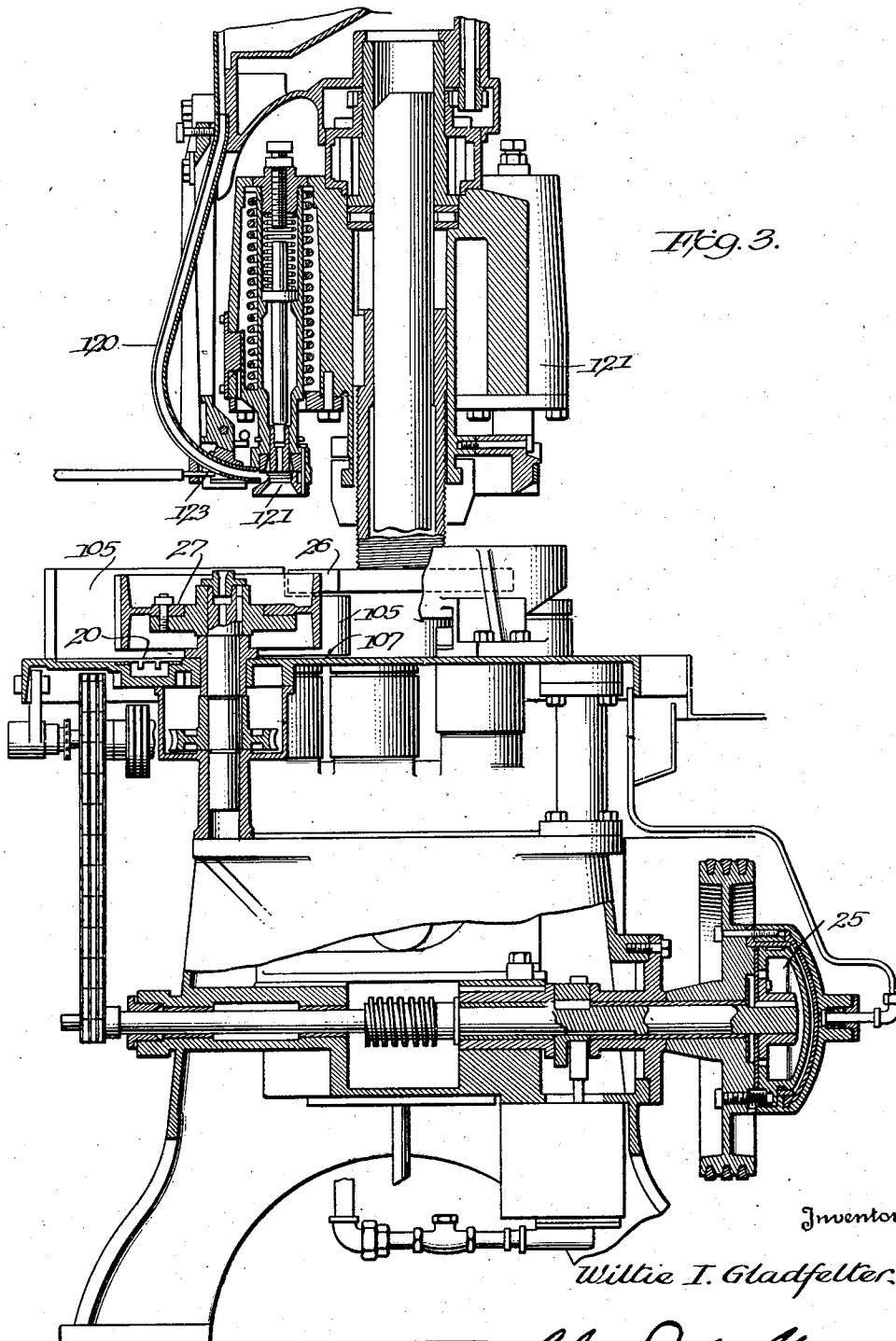
W. I. GLADFELTER

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4 Sheets-Sheet 3



Inventor

Willie I. Gladfelter

By

Richard D. G. G. G.

Attorneys

May 25, 1937.

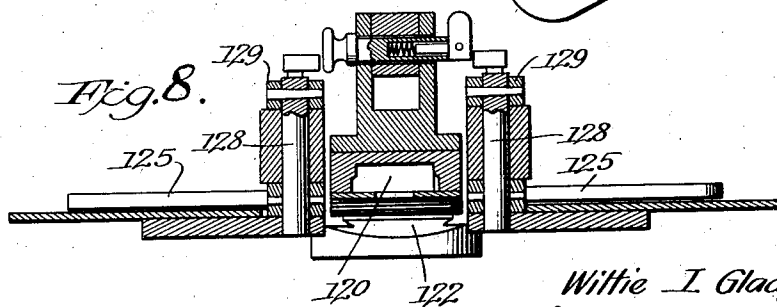
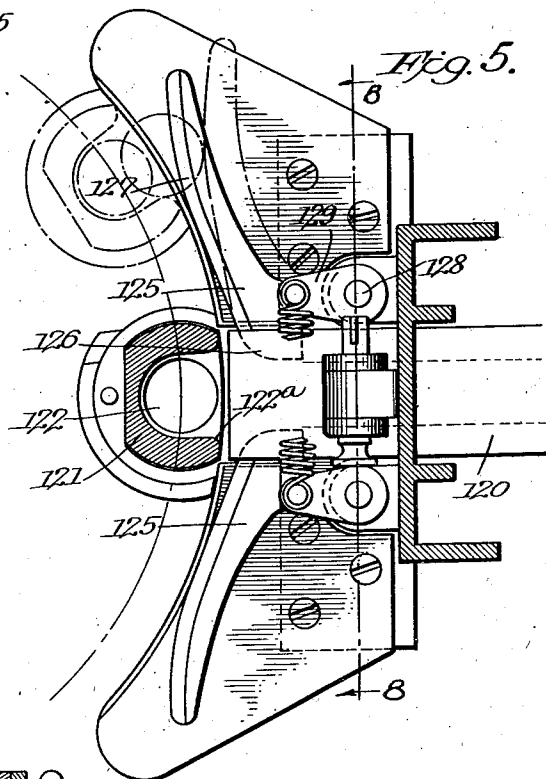
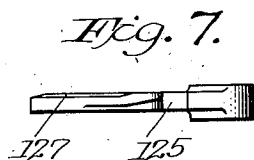
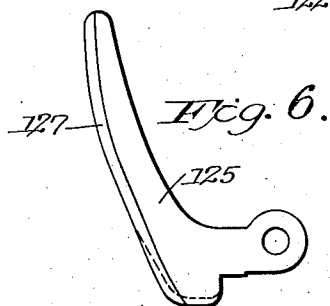
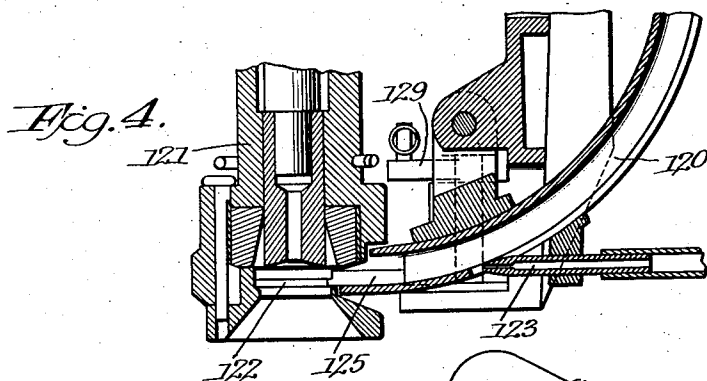
W. I. GLADFELTER

2,081,809

BOTTLE CAPPING MACHINE

Original Filed July 29, 1932

4 Sheets-Sheet 4



Inventor

Willie I. Gladfelter.

By *Ludman, Bryant, Daby & Ludman*

Attorneys

UNITED STATES PATENT OFFICE

2,081,809

BOTTLE CAPPING MACHINE

Wiltie I. Gladfelter, Baltimore, Md., assignor to
Crown Cork & Seal Company, Inc., Baltimore,
Md., a corporation of New York

Original application July 29, 1932, Serial No.
626,151. Divided and this application January
23, 1935, Serial No. 3,176

9 Claims. (Cl. 226-84)

This invention relates to a new and improved machine for handling and treating bottles. More particularly, it relates to a machine for applying closures of the crown cap type to a previously filled bottle, although many features of the machine may be readily applied to a machine adapted to fill bottles, or to a machine adapted to both fill and cap bottles. It will be apparent, therefore, that, although the specific embodiment of the invention shown in the accompanying drawings and described in the specification is applied to a bottle capping machine, the invention is not limited thereto, but may be readily used with other types of machines.

It is a primary object of the present invention to provide new and advantageous means for handling bottles in the machine.

It is a further object of the invention to provide a machine which may be readily changed over from operation on one size bottle to operation on another size bottle.

It is a further object of the invention to provide a novel form of bottle rest which facilitates the above-mentioned change-over. Furthermore, the novel form of bottle rest permits automatic cleaning thereof to remove foreign material such as broken glass or the like, so that a new bottle positioned on the rest will be supported in proper upright relation, and will not be tilted by reason of foreign matter on the bottle supporting surface of the rest.

It is a further object of the invention to provide a member which will automatically function to remove such foreign matter from the bottle rest.

It is a further object of the invention to provide a machine having a greatly simplified power driving system, which is not only efficient in operation, but is also inexpensive to manufacture and accessible for adjustment and repair.

Another important feature of the machine of the present invention relates to a novel means of feeding and delivering crown caps to the several capping heads associated with the machine. This means comprises an improved form of crown wiping device, and an air blast device for accelerating the movement of the crowns in the crown feeding chute.

In the accompanying drawings, a specific embodiment of the machine of the present invention is illustrated. It is to be understood that the machine disclosed in the drawings and described below is an illustrative embodiment only, and the scope of the invention is not confined

to the details thereof except as specifically limited in the appended claims.

In the drawings:

Figure 1 is a top plan view of the machine with the bottle capping head removed.

Figure 2 is a vertical longitudinal sectional view looking toward the rear, taken on planes substantially parallel to the front of the machine of Figure 1, showing certain parts in section and other parts in elevation.

Figure 3 is a transverse view, partly in elevation and partly in section, looking from the discharge end toward the infeed end of the machine.

Figure 4 is a vertical sectional view through the cap delivery chute and associated parts.

Figure 5 is a horizontal sectional view of Figure 4, showing certain parts in plan.

Figures 6 and 7 show details of the crown wiper of the invention, and

Figure 8 is a vertical sectional view taken on line 8-8 of Figure 5.

The present application is a division of my prior application, Serial No. 626,151, filed July 29, 1932, for Bottle handling machine and control therefor. Reference is made to the prior application for a detailed disclosure of certain parts of the apparatus, relating to the bottle conveying and handling mechanism and the machine control. The present application is confined to the bottle capping turret and associated parts.

Referring to Figure 1 of the drawings, it will be noted that bottles to be capped are carried along on an endless conveyor 20 past an infeed bottle timing device represented generally by reference character 21 to an infeed spider 22. Opposite the spider, there is disposed a movable guard member 23 which is adapted to actuate an air control valve assembly 24, in case an improperly positioned bottle is received by the spider. Thus, if a bottle, from any cause, should become tipped over, the spider would force the same into contact with the guard 23 which, in turn, would actuate the valve of the assembly 24 to cut off the supply of actuating air to the air clutch 25 and stop the machine, all of which is particularly described in my prior application, aforesaid.

From the infeed spider 22, bottles are transferred to a capping head spider 26, where they are carried around, capped, and conveyed to the discharge spider 27.

This discharge spider conveys the capped bottles to the discharge end 28 of the conveyor 20, by which instrumentality the bottles are carried to a labeling machine or the like.

Associated with the conveyor at a point adjacent the discharge end of the machine, is another movable guard 29 connected through a suitable link and lever system with a second air control valve assembly 30. This assembly is arranged to also cut off the supply of air pressure delivered to the clutch 25 to stop the machine, and the valve is actuated by an improperly positioned bottle being discharged from the machine by the discharge spider 27. Thus, if a bottle should become tipped over prior to its discharge from the machine, the machine will be stopped, so that the bottle may be removed before it is conveyed to the labeling machine or the like. Also in case the outfeed conveyor should be jammed due to the labeler being stopped, or from any other cause, the guard 29 will be actuated.

The structure of the upper bottle supporting surface of the several bottle rests of the present machine is an important feature of this invention, because this structure accomplishes certain new and advantageous results. It has been customary in the past to provide the upper end of each vertically reciprocating bottle rest with a socket member having a circular depression corresponding to the shape of the bottle to be supported. When it was desired to change the machine so as to operate upon a different size of bottle, it was necessary to remove each of these socket members and install differently shaped ones. Necessarily, this change over consumed a substantial amount of time and caused a delay in the bottling operation.

The bottle rest of the present invention is provided with a plane, smooth, and uninterrupted upper bottle receiving surface. The upper portion 100 (Fig. 2) of the bottle rest is provided with an inset of rubber or the like 101 and the upper surface thereof is substantially smooth and has no upstanding marginal flange. The bottles are pushed onto the rests by means of the infeed spider 22, and are accurately positioned with respect to the several capping heads by the side walls 102 of the capping head spider 26. I have found that the conventional bottle receiving recess in the bottle rests of present day machines is wholly unnecessary to a proper positioning of bottles. Consequently, when it is desired to change the machine of my invention from operation upon one size of bottle to another, it is only necessary to remove the two halves of the capping head spider 26.

Another important advantage of forming the bottle rests with a plane uninterrupted upper surface resides in the facility with which they may be cleaned. If, in machines of the type commonly employed today, a bottle is by chance broken during the capping operation, the resulting fragments of broken glass become lodged in the corners of the recess in the socket members, and any bottles fed to the sockets before these fragments are removed will be improperly seated and improperly presented to the capping heads, with the result that these subsequent bottles also are likely to be broken. Therefore, prior to my invention, it was necessary in order to remove all fragments of broken glass, to stop the machines and carefully clean each socket.

Automatic means are provided for substantially wiping the several bottle supporting surfaces during each revolution of the machine. This means comprises a bracket 105 presenting a vertical wall extending from the point adjacent the central capping head post 106 under the spider 26 out-

wardly around the discharge spider 27. This bracket serves as a guide for bottles being discharged from the machine, and the vertical wall thereof terminates in an edge 107 closely overlying the upper surface of each bottle rest as it passes thereunder. This edge also contacts the main platform of the machine and closely overlies the conveyor 20. As a result, any broken glass or other trash lying upon the upper surface of the bottle rests is wiped therefrom by this member, is transported to the conveyor 20, and is carried thereby from the machine. Thus, if a bottle should become broken by accident in the machine of the present invention, it is unnecessary to stop the machine and clean off the bottle rests, because all fragments of glass will be automatically removed.

Referring now to the novel features of the invention disclosed in Figures 4 to 8 inclusive, a crown feeding chute 120 of substantially conventional form is disclosed. This chute is designed to deliver closure caps to each of the several capping heads 121 as they pass by the mouth of the chute. Each capping head is provided with a crown receiving platform 122, in accordance with present day practice.

Because of the high speed with which the machine of this invention operates, it has been found necessary to provide means for accelerating the delivery of crown caps down the chute to the capping heads. Such means takes the form of an air blast nozzle 123 directed through an opening in the bottom of the chute substantially tangential to the curve thereof. The blast of air delivered from this nozzle tends to slightly lift the crowns as they slide down the chute and imparts to them a forward movement, so that they do not hesitate in their transfer from the mouth of the chute to the crown receiving platforms in the capping heads.

The present invention also includes a new and improved form of wiping element adapted to roll and wipe the delivered crowns into properly seated position in the platforms. The wiper element 125 is provided with a shoulder 126 adjacent the mouth of the chute and also with an elongated arm 127. If a cap is improperly positioned in the head 121, its periphery will abut the shoulder 126 as the head moves in its path laterally away from the mouth of the chute, and this shoulder normally will force the cap into proper position. If the cap should be positioned in such manner that it would tend to become wedged between the corner 122a of the crown receiving platform and the shoulder 126, it might be forced past the shoulder without being delivered to the platform, and to prevent this, I provide the elongated arm 127. The rolling and wiping action imparted to the crown by this member will assure the entry of the crown to the platform in every instance.

It will be noted that the wiper element 125 is fixed to a pivot pin 128, which pin is provided adjacent its upper end with an outwardly projecting lever arm 129. A tension spring is connected to the end of this arm to swing the wiper into operative position.

Preferably, the crown feeding mechanism of the present invention is provided with a pair of similar wiping elements, one at each side of the chute, so that the machine will operate equally well with a right or left hand feed. In the normal operation of the machine, the extra wiper element performs an advantageous function in

that it serves to correctly seat any crowns which may have been carried around in a capping head without being applied to a bottle.

I claim:—

5 1. In a machine of the class described, an infeed spider, an outfeed spider, a capping turret, and a guide between said spiders and adapted to cooperate with the spiders to effect a transfer of bottles to and from the capping turret, said turret comprising a plurality of vertically movable
10 bottle rests mounted for revolution about a vertical axis, each of said rests having a plane, uninterrupted, upper bottle supporting surface arranged to pass under said guide in substantially
15 wiping contact with the lower edge thereof, when said rest is at its lower limit of movement, whereby the bottle supporting surfaces of said rests will be cleaned after leaving the outfeed spider and before presentation to the infeed
20 spider.

2. In a machine of the class described, a substantially horizontal platform, an infeed spider, an outfeed spider, a capping turret, and a guide overlying said platform between said spiders and adapted to facilitate transfer of bottles to and
25 from the capping turret by said spiders, said turret comprising a plurality of vertically movable bottle rests mounted for revolution about a vertical axis and having plane, uninterrupted bottle
30 supporting surfaces disposed substantially in the plane of said platform when said rests are at their lower limit of movement and are in bottle receiving and discharging position, said plane
35 upper bottle supporting surfaces of said rests being arranged to pass under said guide when in the plane of said table in substantially wiping contact with the lower edge thereof, whereby said
40 surfaces will be cleaned after leaving the outfeed spider and before presentation to the infeed spider.

3. A machine of the class described comprising a substantially horizontal platform, bottle conveying means disposed substantially in the plane
45 of said platform, a plurality of bottle rests each mounted for revolution about a common axis and each having a substantially plane horizontal uninterrupted bottle supporting surface, and a guide member having its lower surface closely
50 overlying said platform, said conveying means and said bottle rests, said member being positioned substantially to wipe each rest of trash or broken glass situated thereon and to transfer the same to said conveying means for removal thereby.

55 4. A machine of the class described comprising a substantially horizontal platform, bottle conveying means disposed substantially in the plane of said platform, a plurality of vertically reciprocable bottle rests each mounted for revolution
60 about a common axis and having spaced receiving and discharge positions adjacent said conveying means, a stationary bottle guide positioned between said receiving and discharge positions to facilitate transfer of bottles to and
65 from said rests, said guide having its lower surface substantially contacting the bottle supporting surface of each rest to wipe the same prior to its reception of a new bottle at said receiving position and after each rest has passed said discharge position.

70 5. In a capping apparatus, the combination with a crown feeding chute and a plurality of capping heads arranged to move past said chute and provided with crown receiving platforms, of
75 a pivotally mounted wiper for wiping crowns into

position in said platforms, said wiper comprising a shouldered portion adjacent the mouth of the chute and a rigid elongated arm associated with said shouldered portion for pivotal movement
5 therewith, said arm extending a substantial distance along the path of travel of said capping heads, said shoulder being positioned to normally deliver crowns to said receiving platforms, said
10 elongated arm serving to deliver to said receiving platforms by rolling and wiping action any abnormally positioned crowns not delivered thereinto by said shoulder.

6. In a capping apparatus, the combination with a crown feeding chute and a plurality of capping heads arranged to move past said chute
15 and provided with crown receiving platforms, of a pair of pivotally mounted similar wipers for wiping crowns into position in said platforms, said wipers each being located on opposite sides of said chute, each of said wipers comprising a
20 shoulder adjacent the mouth of said chute and a rigid elongated arm extending a substantial distance along the path of travel of said capping heads, said shoulder of said wiper first contacted
25 by said crowns being positioned to normally deliver crowns into said receiving platforms and said elongated arm thereof serving to deliver to said platforms by rolling and wiping action any
30 abnormally positioned crowns not delivered thereinto by said shoulder, said other wiper on the other side of said chute serving to wipe into position in said platforms any crowns carried
35 around with said capping heads without being applied to said bottle.

7. In a capping apparatus, the combination
35 with a crown feeding chute and a plurality of capping heads arranged to move past said chute and provided with crown receiving platforms, of a pivotally mounted wiper for wiping crowns into position in said platform, and means including
40 a spring tending to swing said wiper toward said capping heads, said wiper having a shoulder adjacent the mouth of said chute and having an integral elongated rigid arm extending a substantial
45 distance along the path of travel of said capping heads, said shoulder being positioned to normally deliver crowns to said receiving platforms, said elongated arm serving to deliver to said receiving platforms by rolling and wiping
50 action, any abnormally positioned crowns not delivered thereinto by said shoulder.

8. In a capping apparatus, the combination with a crown feeding chute and a plurality of capping heads arranged to move past said chute
55 and provided with crown receiving platforms, of a pivotally mounted wiper for wiping crowns into position in said platforms, and means tending to swing said wiper toward said capping heads, said means comprising a pivoted pin to which
60 said wiper is secured, an arm on said pin, and a spring connected to said arm, said wiper having a shoulder adjacent the mouth of said chute and a rigid elongated arm associated therewith and extending a substantial distance along the path of travel of said capping heads, said
65 shoulder being positioned to normally deliver crowns to said receiving platforms, said elongated arm serving to deliver to said receiving platforms by rolling and wiping action, any abnormally positioned crowns not delivered thereinto
70 by said shoulder.

9. In a bottle treating and handling machine, a stationary platform, a rotary table, a plurality of vertically movable bottle rests associated with
75 said table having plane uninterrupted upper sur-

faces substantially flush with the table when at their lower position, and a bottle transferring guide extending over a portion of the table and the platform and overlying said rests during a portion of their movement in their lowered position during rotation of the table, the lower edge of the guide being positioned substantially in

wiping contact with the upper surface of the table and the upper surfaces of the bottle rests as the latter pass therebeneath, whereby said guide serves to clean the surfaces of the table and rests of broken glass and trash.

WILFIE I. GLADFELTER.