

March 21, 1950

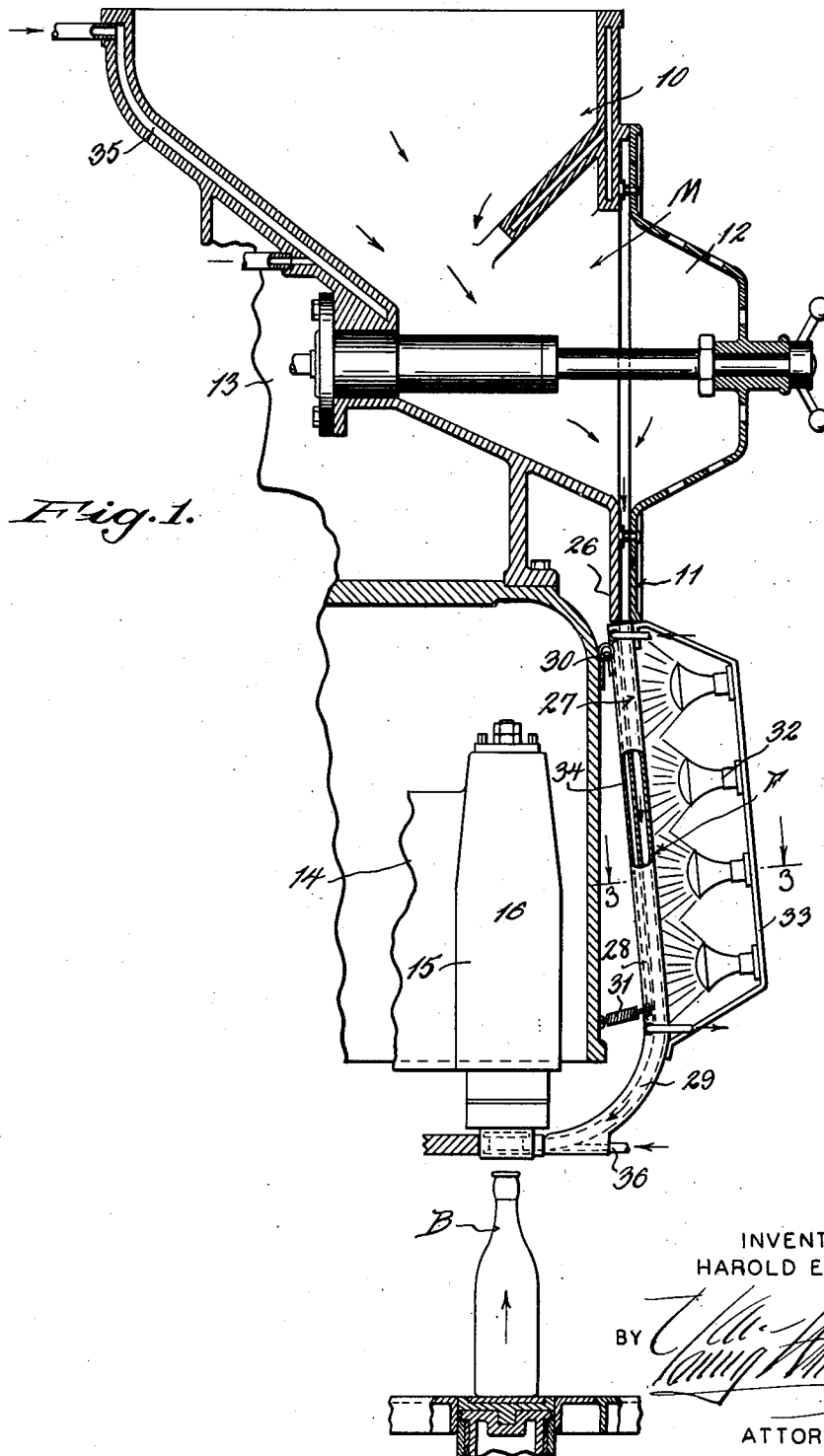
H. E. RUE

2,501,291

CAP PREHEATING AND FEEDING STRUCTURE

Original Filed June 5, 1943

2 Sheets-Sheet 1



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Fig. 2.

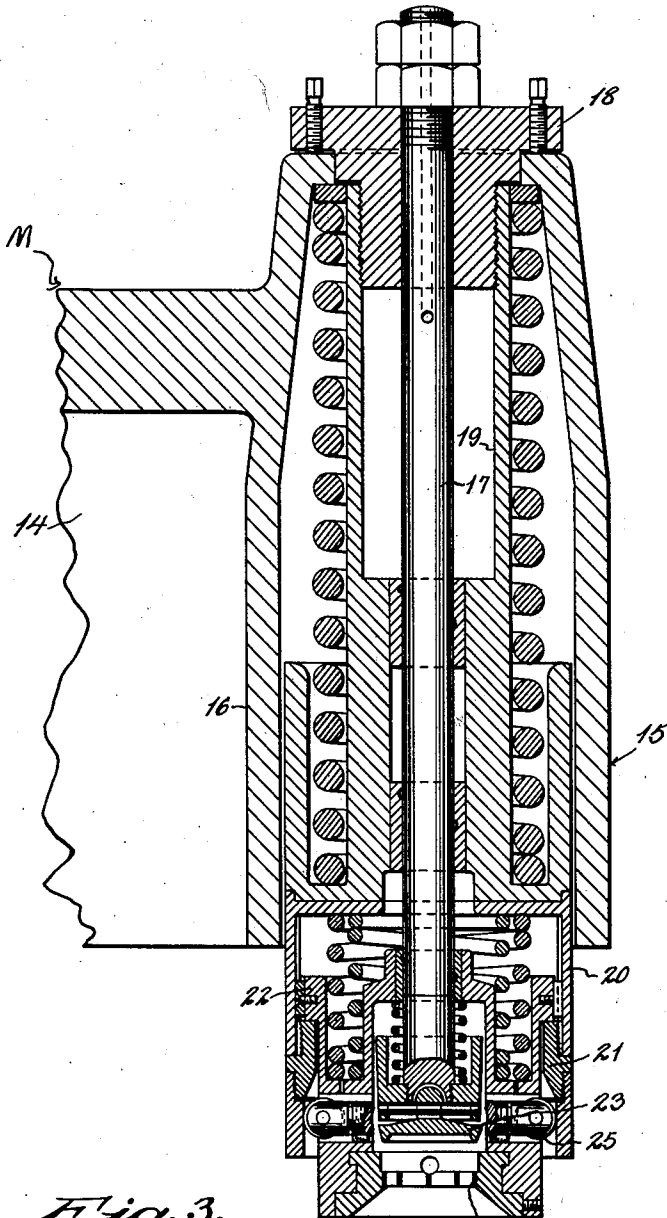
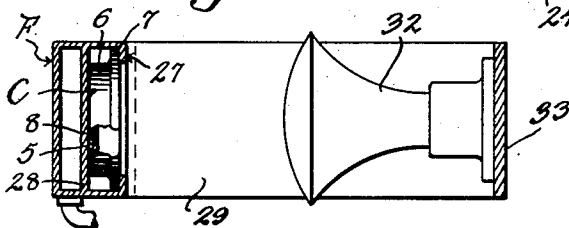


Fig. 3.



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UNITED STATES PATENT OFFICE

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CAP PREHEATING AND FEEDING
STRUCTUREHarold E. Rue, Wauwatosa, Wis., assignor to
Pabst Brewing Company, Wauwatosa, Wis.Original application June 5, 1943, Serial No.
489,771, now Patent No. 2,422,750, dated June
24, 1947. Divided and this application Sep-
tember 23, 1944, Serial No. 555,482

2 Claims. (Cl. 226—88.1)

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This invention appertains to a crown capping machine for forming or molding plastic crown caps on the bottles to bring about the tight sealing of the bottles and is a division of my pending application Serial No. 489,771, filed June 5, 1943, and entitled Plastic bottle crowner, now Patent 2,422,750, June 24, 1947.

One of the primary objects of the present invention is to provide novel means for supplying pre-heated plastic caps at the rate that they are being used to the crowning head of a bottle capping machine.

Another salient object of my invention is the provision of means incorporated directly with the bottle capping machine for effectively heating and feeding plastic caps to the crowning heads of a bottle crowning machine, said heating means being disposed between the cap hopper and the crowning head of the machine.

A further object of my invention is the provision of novel means for heating the skirts only of the caps, as the caps or crowns are fed to the crowning heads, whereby the skirts can be readily deformed and pressed into sealing contact with the bottles.

A further important object of my invention is the provision of means operating in conjunction with the chute which delivers the caps from the hopper to the crowning heads, for heating the skirts only of the caps to a moldable condition by a battery of infra-red lamps or equivalent apparatus, so that the caps can be effectively acted upon by the cap plungers in the crowning heads.

With these and other objects in view, the invention consists in the novel construction, arrangement and formation of parts, as will be hereinafter more specifically described, claimed and illustrated in the accompanying drawings in which drawings:

Figure 1 is a fragmentary detailed vertical sectional view through the upper part of a bottle crown capping machine showing a bottle moving to its crowning station and illustrating one form of my novel means for delivering pre-heated plastic caps to the crowning head at the rate that the caps are being used.

Figure 2 is an enlarged, detailed, vertical sectional view through one of the crowning heads of the crowning machine.

Figure 3 is an enlarged detailed sectional view taken on the line 3—3 of Figure 1 looking in the direction of the arrows.

Referring to the drawings in detail, wherein similar reference characters designate corresponding parts throughout the several views, the

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letter M generally indicates a crowning machine constructed in accordance with my invention for applying my plastic caps C to bottles B.

This machine M is of the general character now found in the open market for applying metal crown caps to bottles and has been described in some detail in my parent application heretofore mentioned. Therefore, the machine will not be described in detail and only sufficient parts thereof have been illustrated to show the use of my novel cap feeding and heating means F.

The caps C have also been described in detail in the said parent application and have been further illustrated, described and claimed in another divisional application. However, it will be noted that the caps C include an outer or top wall 5 having a depending skirt 6 provided with a marginal flange 7. A compressible disk 8 is placed in the cap against the inner surface of the top wall. The flange 7 adds strength to the skirt and provides sufficient material to insure the molding of the skirt under and around the flange or lip of a bottle.

The machine M includes a hopper 10 for the caps C and the caps are fed, one at a time, with the skirts outermost to a cap chute 11 by means of a feed dial assembly 12 now found in machines on the market. The hopper 10 is mounted on the machine frame 13 above the rotary head casing 14. This rotary head casing 14 includes a plurality of radially disposed crowning heads 15 which form the salient part of my parent application. One crowning head 15 has been illustrated only for the purpose of showing the combination between the hopper and a crowning head and my novel cap feeding and pre-heating means.

The bottles are fed to the crowning heads in proper timed relation as is readily understood by those skilled in the art. The caps C are fed one at a time into each crowning head during the rotation of the crowning head casing and the feeding station of the caps is located between the inlet of the bottles to the crowning heads and the outlet of the bottles from the crowning heads.

Each crowning head 15 includes a substantially cylindrical housing 16, which forms a part of the rotary head casing. Axially mounted within each crowning head housing 16 is the crown hold-down plunger 17 and this plunger is slidably mounted in the crown plunger spring nut 18 and the compensating spring holder 19. Fixed to the lower end of the spring holder 19 is a substantially cylindrical guide shell 20 which carries the crown forming plunger throat ring 21. Slidably mounted in the guide shell 20 is the crown forming

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plunger cage or carrier 22, and it is to be noted that the axial crown hold-down plunger 17 extends into the cage or carrier 22 and that the cage or carrier slides on the axial plunger as well as in the shell 20. The hold-down plunger 17 carries the hold-down head 23.

The lower end of the cage or carrier 22 as removably associated therewith, the crown platform 24 and the crowns or caps are fed into the platform by my novel device F. The cage or carrier 22 supports a plurality of radially extending crown forming or crimping plungers 25.

Briefly, when a bottle is at the crowning station and a cap has been fed on to the platform 24 the bottle is moved upwardly, by an appropriate mechanism and the hold-down head centers and holds the cap on the bottle and the crimping plungers are forced inwardly by the throat ring 21 to crimp and deform and mold the heated skirts of the cap around the bottle neck.

Referring back to the feed chute 11 for the crowning caps, it is to be noted that the same consists of a depending straight portion 26 which leads from the hopper, and this portion communicates directly with the upper end of my novel cap feeding and heating means F.

This means F includes a downwardly extending feed chute or track 27 and this feed chute or track extends from the hopper chute portion 26 to the crowning station for the bottles and is adapted to feed a crowning cap onto the platform 24 of a crowning head 15 when the same reaches the station. This crown chute or track 27 consists of an elongated substantially straight body portion 28 and an inwardly curved arcuate guide portion 29 which terminates at the crowning station. If desired the upper end of the guide track or chute 27 can be hingedly mounted as at 30 on the machine casing and the lower end of the track can be urged inward toward the crowning head by a coil spring 31.

As heretofore stated, one of the important features of my invention is the provision of means for heating the skirts of the plastic cap C to a moldable condition and the means for heating the skirts of the caps is located between the hopper and the crowning station. This location is of importance as the caps are served with their heated skirts to each separate crowning head. These caps are fed and heated at the same rate that they are being used. For the purpose of illustration, I have shown a battery of infra-red lamps 32 carried by a bracket or casing 33, which is secured directly to the receiving cap feed chute or track 27. The exact arrangement of the battery of the infra-red lamps may be changed and, in fact, another form of device for heating the skirts may be used. Any other means can be utilized between the hopper and the crowning head for heating the skirts of the caps to a moldable condition, such as a high frequency induced heating means, in combination with any other means for mechanically feeding the caps to the crowning heads.

It is important to note, however, that the crowning caps are fed down the chute or track 27 with the skirts facing the battery of infra-red lamps and hence the skirts only of the caps are heated and the top walls 5 of the caps are protected from the heat by their compressible disks 8. If desired, the rear or inner wall of the chute can carry a water jacket 34, so as to maintain the top walls 5 of the caps in a comparatively cool condition. An inlet and an outlet for the water is carried by the terminals of the chute.

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If preferred, however, the caps can be treated to take off the initial chill before the same reach the guide and feeding chute or track 27. Thus the hopper 10 can be provided with a water jacket 35 and water or other heating fluid can be circulated through the jacket in any preferred way.

The chute or track 27 can be of a substantially C shape in cross section (see Figure 3), so as to allow the heat from the infra-red lamps to act upon the skirts of the caps.

In operation of my novel apparatus, the crowns or caps are selected from the hopper 10 and are fed into the chute or track 27 with their skirts facing outermost and the chute from its top to bottom becomes loaded with the crowns or caps. The caps are now subjected to the heat emanating from the battery of infra-red lamps and their skirts are heated to a moldable condition. The outer walls of the caps are protected from the intense heat of the infra-red lamps by the cork discs 8, and these outer or top walls of the caps can also be cooled by the water jacket 34. As a crowning head 16 passes the lower curved end 29 of the chute or track, a cap is forced into the crown platform thereof by gravity and the weight of the other caps in the chute pressing thereon. If desired, the lower end of the chute can have communicating therewith a nipple 36 for directing a blast of heated air into the chute for urging the cap into the crown platform. Heated air under pressure can be supplied to the nipple from any preferred source. After a crown cap in its heated condition is supplied to the crown platform of the crowning head 16 the crown cap is applied to the bottle B in the manner set forth and described in detail in my parent application.

Changes in details may be made without departing from the spirit or the scope of my invention, but what I claim as new is:

1. In a machine for crowning bottles with plastic caps, a hopper for the caps, a rotary crowning head, means for delivering caps from the hopper to the crowning head, means for rendering the skirts of the caps to a moldable condition prior to the delivery thereof to the crowning head, means for maintaining the top walls of the caps in a solidified condition against distortion and said crowning heads including means for holding the top walls of the caps under sealing pressure tight against the upper surface of a bottle, and means for molding the heated skirt under and around the bead of the bottle during the holding of the top wall in sealing contact with the bottle.

2. In a machine for crowning bottles with plastic caps, a crowning head, a chute for delivering caps to the head, means for feeding caps to the chute with the skirts of the caps all facing outward in the same direction, means for heating the skirts of the caps as the same travel along the length of the chute, and means associated with the chute for cooling the top walls of the caps.

HAROLD E. RUE.

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The following references are of record in the file of this patent:

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