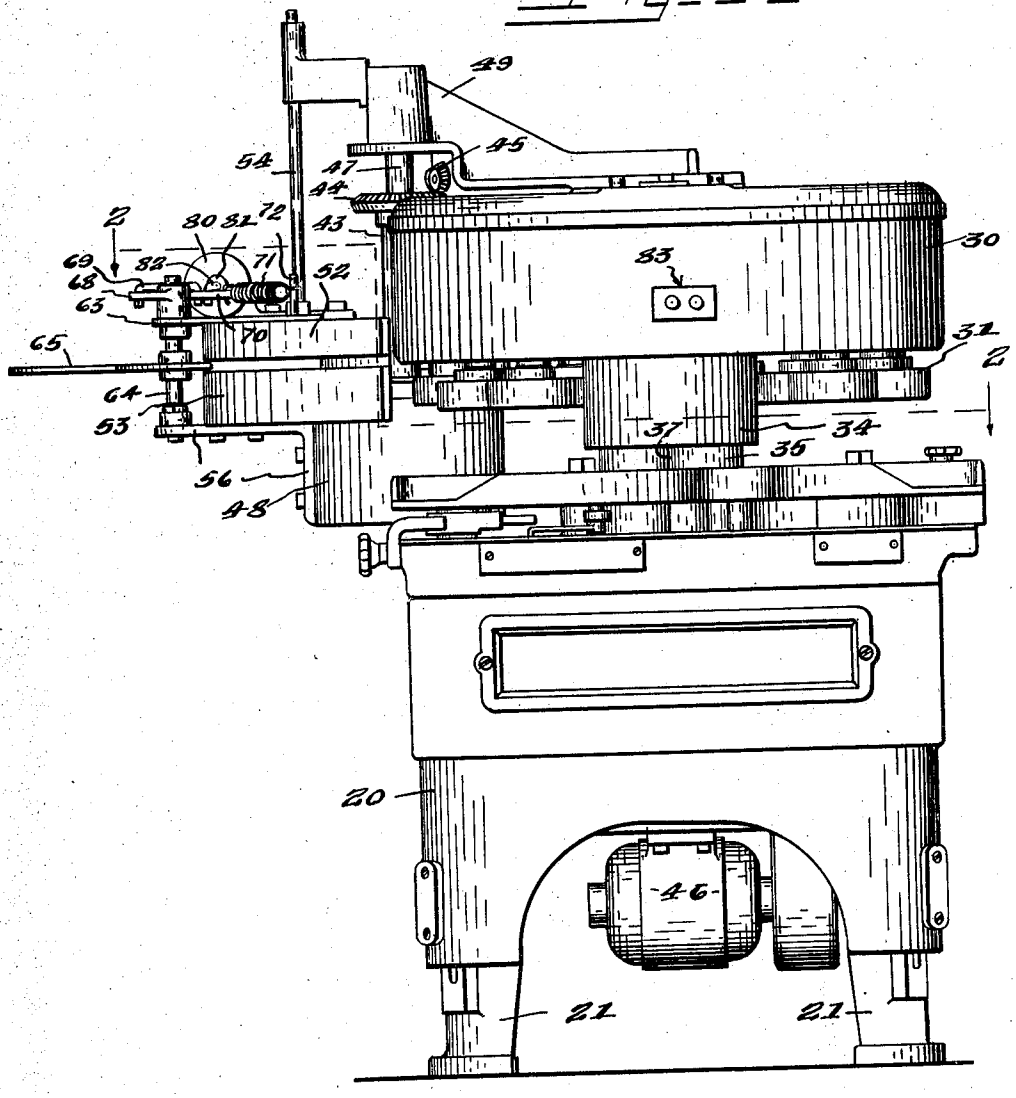
Feb. 23, 1943. I. L. WILCOX 2,312,141

BOTTLE CAPPING MACHINE

Filed Nov. 7, 1940 4 Sheets-Sheet 1

Fig. 1



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BOTTLE CAPPING MACHINE

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Fig-2-

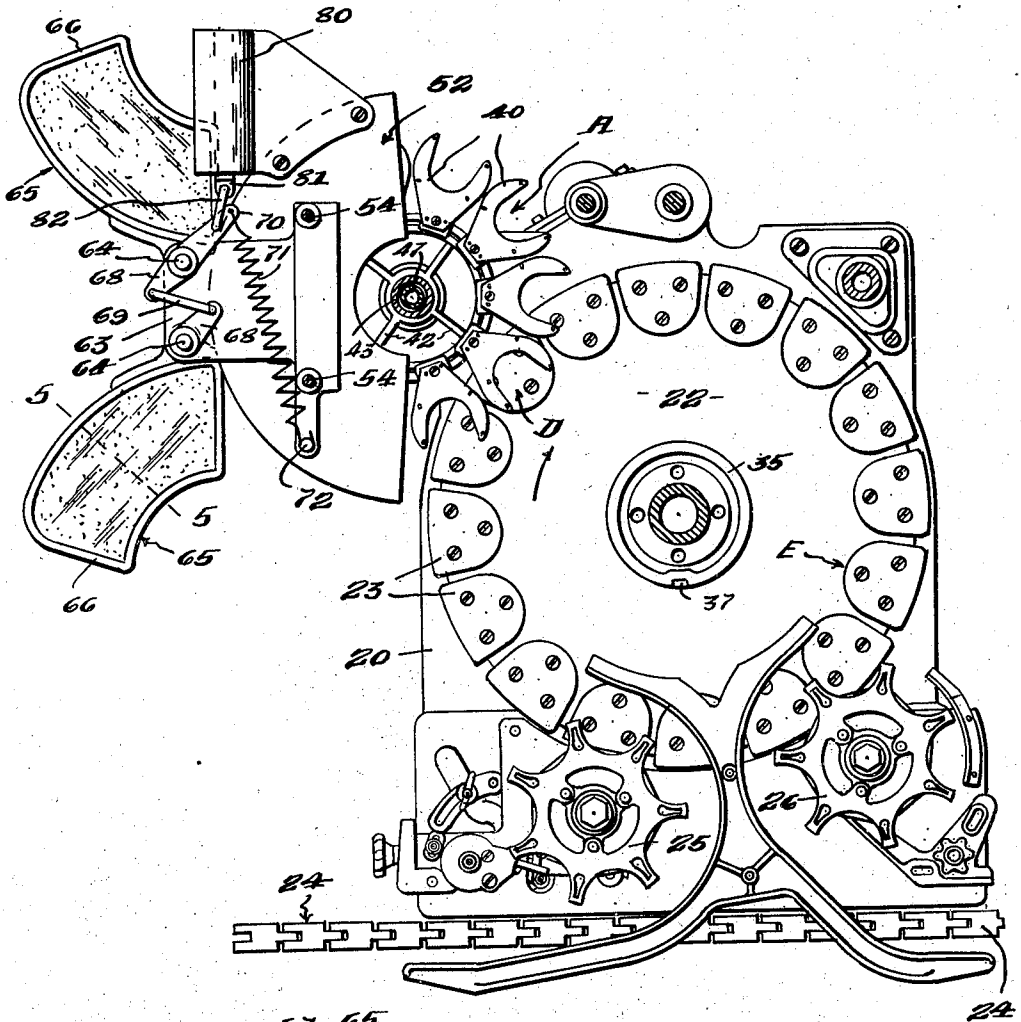




Fig-5-

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BOTTLE CAPPING MACHINE

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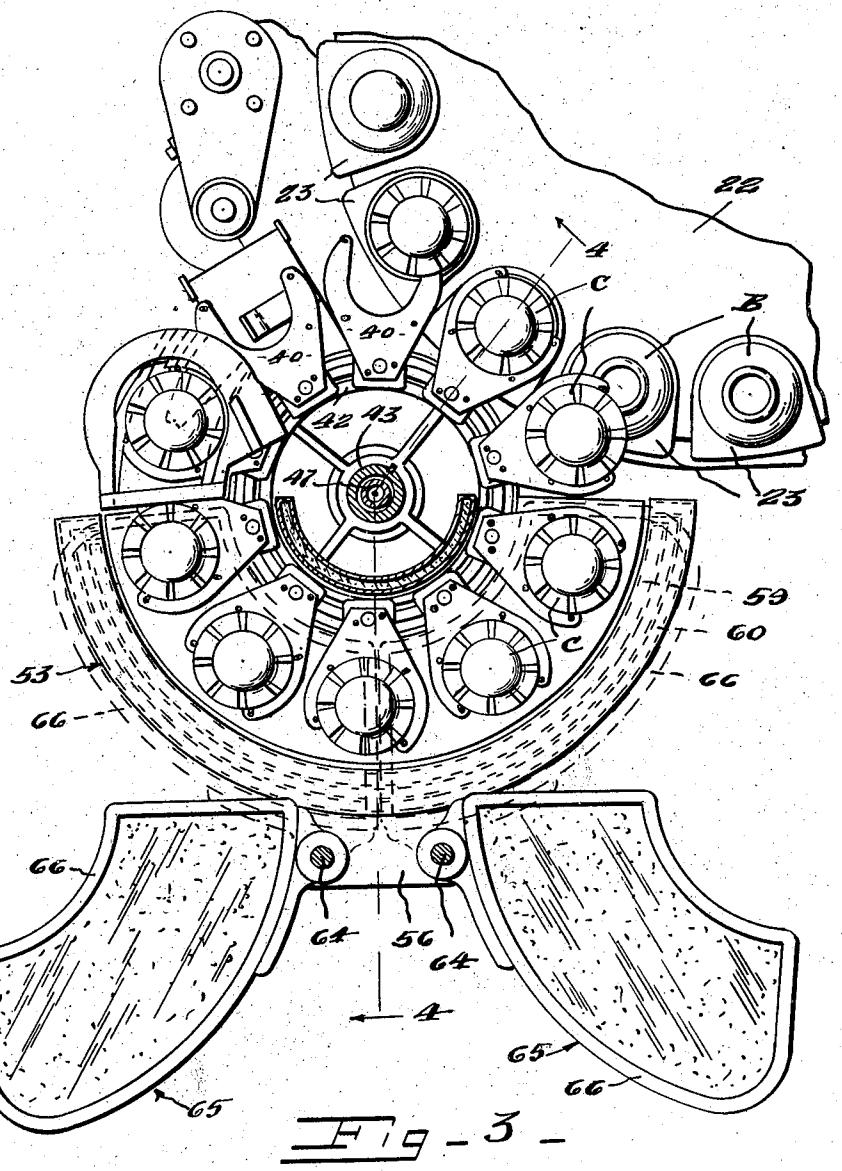


Fig - 3 -

INVENTOR.

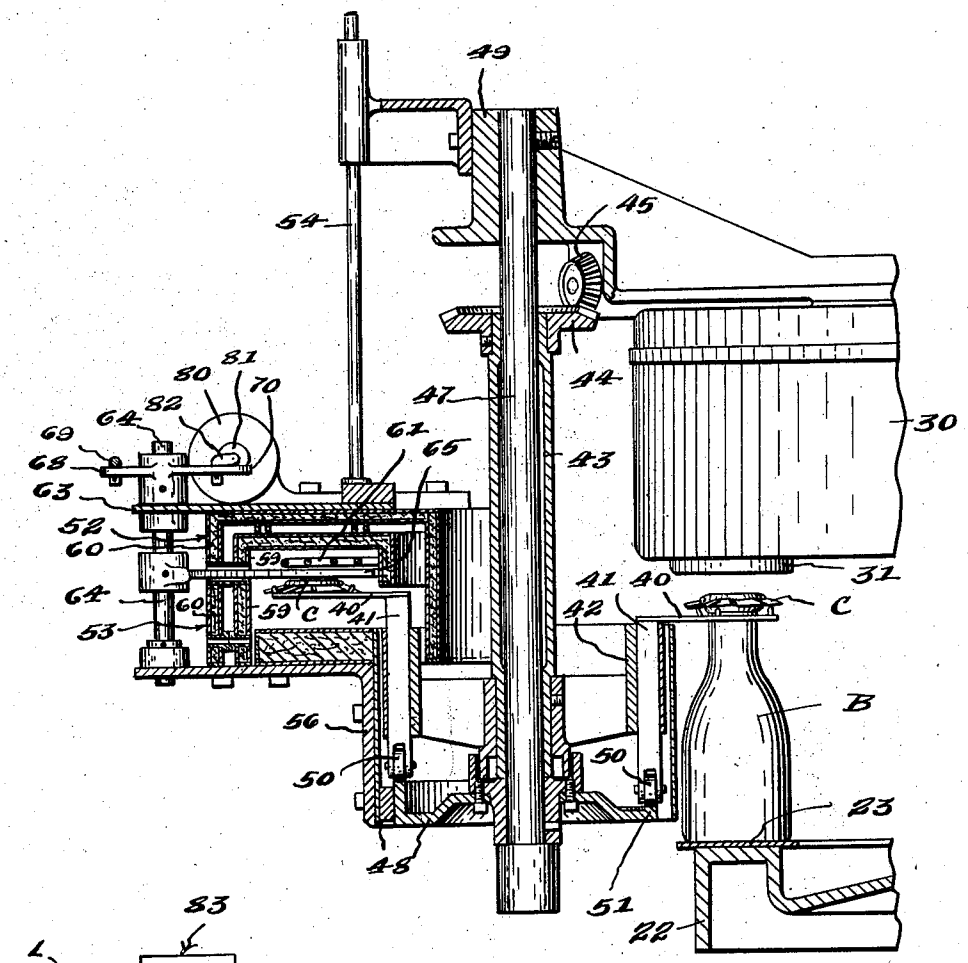
BY Isaac L. Wilcox
Bodell & Thompson
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BOTTLE CAPPING MACHINE

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Fig - 4 -



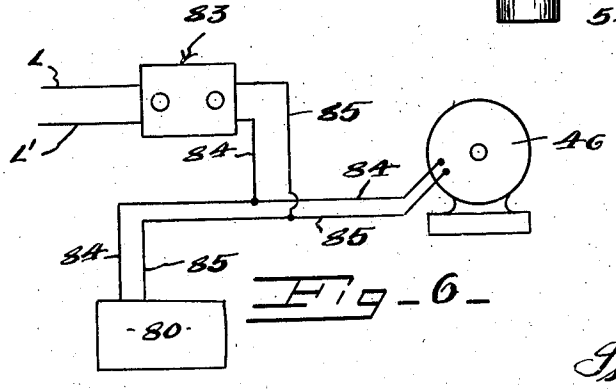


Fig - 6 -

INVENTOR.

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ATTORNEYS.

Patented Feb. 23, 1943

2,312,141

UNITED STATES PATENT OFFICE

2,312,141

BOTTLE CAPPING MACHINE

Isaac L. Wilcox, Fulton, N. Y., assignor to Oswego Falls Corporation, Fulton, N. Y., a corporation of New York

Application November 7, 1940, Serial No. 364,694

9 Claims. (Cl. 226—83)

This invention relates to a machine for applying hood caps to bottles and in particular to applying hood caps formed of a disk of paper or paper board, at least the marginal surface of which is provided with a substance rendered adhesive by the application of heat to the cap disk. This marginal portion is folded and gathered downwardly about the neck of the bottle with overlapping portions which are secured together by the adhesive and thus make the cap self securing to the top of the bottle.

The machine in general is of the type disclosed in the copending application of A. A. Barnes and J. F. Price, Sr. No. 286,638, filed July 26, 1939. This machine consists of means in the nature of a turret for advancing a procession of bottles to a cap applying station, and means for advancing a procession of caps to said station. The means for advancing the bottles and the caps are operated in timed relation, whereby a cap predestined for a particular bottle meets the bottle at the cap receiving station. The machine also includes an oven arranged in juxtaposition to the cap receiving station and through which the caps are advanced and by which they are properly heated to a moldable self-securing condition.

This invention has as an object a machine of the type described embodying means in the nature of a shield movable into position to materially reduce the heat transfer from the cap heater or oven to the cap, and means operable, when the advancement of the procession of caps is stopped, to effect movement of said shield in such heat shielding position, said means being operable automatically to move the shield out of heat shielding position when the procession of caps is again moved.

The invention consists in the novel features and in the combinations and constructions hereinafter set forth and claimed.

In describing this invention, reference is had to the accompanying drawings in which like characters designate corresponding parts in all the views.

Figure 1 is a front elevational view of a machine embodying my invention.

Figure 2 is a view taken substantially on line 2—2, Figure 1.

Figure 3 is a view, similar to Figure 2, taken substantially through the center of the cap heating oven just above the heat shielding member.

Figure 4 is a vertical sectional view of the oven and contiguous mechanism taken on a line coinciding with line 4—4, Figure 3.

Figure 5 is a sectional view of the shield member taken on substantially line 5—5, Figure 2.

Figure 6 is a schematic wiring diagram illustrating the electrical connections of the machine.

The machine proper consists of a frame including a base 20 mounted on legs 21. A bottle advancing turret 22 is rotatably journalled on a vertical axis arranged centrally of the base, and the turret is provided with a plurality of circumferentially spaced apart bottle seats or pads 23. The bottles are conveyed to and from the machine by a conveyor 24 extending across the front of the machine, as shown in Figure 2, the bottles being fed onto the turret 22 by an in-feed star wheel 25 and being removed from the turret and returned to the conveyor 24 by an out-feed star wheel 26.

The upper structure of the machine includes a cylindrical casing 30 in which is arranged an annular series of cap contracting heads 31. There is a cap contracting head 31 arranged axially above each of the bottle pads 23. The annular series of heads 31 are carried on a supporting structure, not shown, which is provided with a hub portion 34 having telescoping engagement with a hub portion 35 extending upwardly from the turret. The hub 34 is slidably mounted for vertical adjustment on the turret hub 35 to accommodate the machine for different heights of bottles, and the two hubs rotate in unison by means of a key 37, all whereby a cap contracting head 31 travels continuously above each of the bottle pads 23. The upper casing 30 also includes mechanism for moving the cap contracting heads 31 vertically toward and from the bottles B to effect contraction of the skirt portions of the caps C.

The caps C are arranged in stack formation in a magazine, not shown, arranged at the rear of the machine, and as each bottle enters the star wheel 25, a cap is transferred from the stack formation and is deposited on one of the fork members 40 when such member is substantially in the position indicated at A, Figure 2. Each fork member 40 is mounted upon a stem 41 slidably mounted in the periphery of a spider member 42 secured to the lower end of a sleeve 43, the upper end of which is provided with a beveled gear 44 arranged in mesh with a driving gear 45. The turret 22, the annular series of cap contracting heads 31, and the gear 45 are all rotated in timed relation by a motor 46 arranged in the base of the machine. The sleeve 43 is rotatably mounted on a shaft 47 and is supported thereby

as is also the cam track 48. The shaft is supported by bracket 49 secured to the top casing 30.

The lower end of each stem 41 is provided with a roller 50 which engages the circular cam track 48. The arrangement is such that when the fork cap carrying members 40 are in the position shown at A, Figure 2, they are elevated and remain elevated until they reach the position indicated at D, Figure 2, at which time the lower section 51 of the cam track 48 permits the cap carrying members 40 to move downwardly and deposit the cap carried thereby on the top of the bottle which has then reached the cap receiving station D. Shortly thereafter, the corresponding closing head 31 descends and contracts the skirt portion of the cap about the top of the bottle and subsequently releases and moves upwardly to the position indicated at E, whereupon the capped bottle is engaged by the out-feed star wheel 26 and transferred back to the bottle conveyor 24. The arrangement is such that as a bottle enters the star wheel 25, a cap is deposited on a fork member 40 at position A, and this particular cap is predestined for this particular bottle. That is, while the bottle is traveling on the turret which operates in a clockwise direction, the cap is traveling on the fork member 40 in a counter-clockwise direction, and the bottle and cap will meet at the cap receiving station D. For a more specific description of the drive mechanism and the cap transfer mechanism referred to, reference may be had to the Barnes and Price application, Sr. No. 286,638 previously alluded to. The structure thus far described forms no part of this invention.

The fork members 40 function to convey the cap through a cap heating oven composed of upper and lower arcuate sections 52, 53. The upper section 52 is supported by rods 54 secured in the bracket 49. The lower oven section 53 is supported by an angle bracket 56 secured to the stationary cam member 48. These oven sections are formed with inner and outer walls 59, 60 of suitable heat insulating material. An arcuate shaped electrical heating element 61 is arranged in the upper oven section 52, whereby the heat therefrom is radiated to the caps C as they are advanced on the members 40.

It will be apparent that should the machine be stopped with a plurality of caps in the oven, as indicated in Figure 3, these caps would become overheated either to the point where the substance with which they are coated would lose its effective adhesive qualities, or to the point where the caps would be charred or otherwise rendered unfit for application to the bottles. This invention has to do in particular with means for preventing this condition in the event the machine should be temporarily shut down.

A plate 63 is secured to the top section of the oven and extends radially outwardly therefrom to form an upper support in which shafts 64 are journalled, the lower ends of these shafts being journalled in a continuation of the bracket 56.

A shield 65, of general arcuate formation, is fixedly secured to each of the shafts 64 and the shields are so arranged that upon rotation of the shafts 64 the shields are moved into and out of heat shielding relation between the heating element 61 and the cap C on the cap conveyor.

The shields 65 are formed out of suitable heat insulating material, such as asbestos, and are provided with a metallic binding 66 encircling their peripheries. The upper surface of the shield, confronting the heating element 61, may be provided with heat reflecting metallic foil 67, Figure 5.

A laterally extending arm 68 is secured to the upper end of each of the shafts 64 and these arms are connected as by a link 69. One of the arms 68 has an inwardly extending portion 70 to which one end of a helical tension spring 71 is secured, the opposite end being secured to a fixed pin 72 mounted upon the upper oven section. This arrangement is such that the spring 71 yieldingly urges the shields 65 inwardly into heat shielding position, as shown in Figure 4.

The shields 65 are momentarily maintained out of heat shielding position, or are maintained in the out position, as illustrated in Figure 2, during the advancement of the caps. The shields are thus maintained in out position against the action of the spring 71 by a solenoid 80 secured to the top oven section and having its core 81 connected to the inwardly extending portion 70 and the link 68 by a link 82. The solenoid 80 and the operating motor 46 are energized from the line L, L', through a start-stop switch 83, conductors 84, 85. That is, when the switch 83 is closed to complete the power circuit to the motor 46, this circuit is simultaneously completed to the solenoid 80. The solenoid 80, when energized, draws in the core 81 effecting rotation of the shaft 64 to move the shield 65 into the out position. When the power circuit to the motor 46 is interrupted by opening the switch 83, the solenoid is simultaneously deenergized and the shields 65 are moved into heat shielding position by action of the spring 71.

With this arrangement, any caps C, which are positioned within the oven at the time the machine is stopped, are adequately protected from becoming overheated, and when the machine is again started the heat shields 65 are automatically moved out of the oven.

What I claim is:

1. A machine for applying hood caps to bottles, the skirts of which caps are coated with a substance rendered adhesive by the application of heat to make the caps self securing on the bottles; comprising in combination a frame, means for advancing a procession of bottles to a cap applying station, a cap heater arranged in juxtaposition to said station, means for advancing a procession of caps to said station, said procession of caps being advanced in heat exchanging relation to said cap heater, a motor operatively connected to both of said advancing means to operate the same in timed relation, whereby a bottle and a heated cap predestined therefor will meet at said station, a shield member movable into and out of heat shielding position between the caps and said heater and being operable, when positioned between the caps and said heater, to shield the caps from excessive heat, said shield being normally positioned out of shielding relation, and means operable upon cessation of the advancement of said caps to effect movement of said shield into shielding position.

2. A machine for applying hood caps to bottles, the skirts of which caps are coated with a substance rendered adhesive by the application of heat to make the caps self securing on the bottles; comprising in combination a frame, means for advancing a procession of bottles to a cap applying station, a cap heater arranged in juxtaposition to said station, means for advancing a procession of caps to said station, said procession of caps being advanced in heat exchanging relation to said cap heater, a motor

operatively connected to both of said advancing means to operate the same in timed relation, whereby a bottle and a heated cap predestined therefor will meet at said station, a power circuit for said motor, a shield member movable into and out of heat shielding position between the caps and said heater and being operable, when positioned between the caps and said heater, to shield the caps from excessive heat, means holding said shield out of heat shielding position during the advancement of the procession of caps and being operable upon the cessation of the advancement of said caps to permit movement of the shield into heat shielding position.

3. A machine for applying hood caps to bottles, the skirts of which caps are coated with a substance rendered adhesive by the application of heat to make the caps self securing on the bottles; comprising in combination a frame, means for advancing a procession of bottles to a cap applying station, a cap heater arranged in juxtaposition to said station, means for advancing a procession of caps to said station, said procession of caps being advanced in heat exchanging relation to said cap heater, a motor operatively connected to both of said advancing means to operate the same in timed relation, whereby a bottle and a heated cap predestined therefor will meet at said station, a power circuit for said motor, a shield member movable into and out of heat shielding position between the caps and said heater and being operable, when positioned between the caps and said heater, to shield the caps from excessive heat, said shield being normally positioned out of shielding relation, and means operable upon interruption of said power circuit to effect movement of said shield into shielding position.

4. A machine for applying hood caps to bottles, the skirts of which caps are coated with a substance rendered adhesive by the application of heat to make the caps self securing on the bottles; comprising in combination a frame, means for advancing a procession of bottles to a cap applying station, a cap heater arranged in juxtaposition to said station, means for advancing a procession of caps to said station, said procession of caps being advanced in heat exchanging relation to said cap heater, a motor operatively connected to both of said advancing means to operate the same in timed relation, whereby a bottle and a heated cap predestined therefor will meet at said station, a power circuit for said motor, a shield member movable into and out of heat shielding position between the caps and said heater and being operable, when positioned between the caps and said heater, to shield the caps from excessive heat, means holding said shield out of heat shielding position during energization of said power circuit and being operable upon interruption of said circuit to permit movement of the shield into heat shielding position.

5. A machine for applying hood caps to bottles, the skirts of which caps are coated with a substance rendered adhesive by the application of heat to make the caps self securing on the bottles; comprising in combination a frame, means for advancing a procession of bottles to a cap applying station, a cap heater arranged in juxtaposition to said station, means for advancing a procession of caps to said station, said procession of caps being advanced in heat exchanging relation to said cap heater, a motor operatively connected to both of said advancing means to operate the same in timed relation, whereby a bottle and a heated cap predestined therefor will meet at said station, a shield member pivotally mounted in juxtaposition to said cap heater and being movable about its pivotal axis into and out of heat shielding position between the caps and said heater and being operable, when positioned between the caps and said heater, to shield the caps from excessive heat, said shield being normally positioned out of heat shielding relation, and means operable upon the cessation of the advancement of said caps to effect movement of said shield about its pivotal axis into heat shielding position.

6. A machine for applying hood caps to bottles, the skirts of which caps are coated with a substance rendered adhesive by the application of heat to make the caps self securing on the bottles; comprising in combination a frame, means for advancing a procession of bottles to a cap applying station, a cap heater arranged in juxtaposition to said station, means for advancing a procession of caps to said station, said procession of caps being advanced in heat exchanging relation to said cap heater, a motor operatively connected to both of said advancing means to operate the same in timed relation, whereby a bottle and a heated cap predestined therefor will meet at said station, a power circuit for said motor, a shield member movable into and out of heat shielding position between the caps and said heater and being operable, when positioned between the caps and said heater, to shield the caps from excessive heat, means yieldingly urging said shield member into heat shielding position, a solenoid operatively connected to said shield and being energized by said power circuit, and said solenoid being operable when energized to hold said shield out of heat shielding position..

7. A machine for applying hood caps to bottles, the skirts of which caps are coated with a substance rendered adhesive by the application of heat to make the caps self securing on the bottles; comprising in combination a frame, means for advancing a procession of bottles to a cap applying station, a cap heating oven arranged in juxtaposition to said station and having a cap inlet and a cap outlet, means for advancing a procession of caps to said station, said procession of caps being advanced through said oven in heat exchanging relation thereto, a motor operatively connected to both of said advancing means to operate the same in timed relation, whereby a bottle and a heated cap predestined therefor will meet at said cap receiving station, a power circuit for said motor, a shielding member formed of heat insulating material movable into and out of said oven and being operable, when positioned in the oven, to shield the caps from excessive heat, means yieldingly urging said shield into the oven, a solenoid operatively connected to said shield and energized from said power circuit and being operable when energized to hold said shield from movement toward the oven.

8. A machine for applying hood caps to bottles, the skirts of which caps are coated with a substance rendered adhesive by the application of heat to make the caps self securing on the bottles; comprising in combination a frame, means for advancing a procession of bottles to a cap applying station, a cap heater arranged in juxtaposition to said station, means for advanc-

ing a procession of caps to said station, said procession being advanced in heat exchanging relation to said cap heater, a motor operatively connected to both of said advancing means to operate the same in timed relation, whereby a bottle and a heated cap predestined therefor will meet at said station, a shield member formed of heat insulating material and movable into and out of heat shielding position between the caps and said heater, the surface of said member confronting said heater being covered with a heat reflecting metallic foil, said shield being positioned out of heat shielding relation during the advancement of said caps, and means operable upon cessation of the advancement of said caps to effect movement of said shield into shielding position.

9. A machine for applying hood caps to bottles, the skirts of which caps are coated with a substance rendered adhesive by the application of heat to make the cap self-securing on the bottles; comprising in combination a suitable frame, means for advancing a procession of bottles to a cap applying station, a cap heater arranged in juxtaposition to said station, means for advancing a procession of caps to be applied to bottles at said station, said procession of caps being advanced in heat exchanging relation to said cap heater, a shield member movable into and out of heat shielding position between the caps and said heater and being operable when positioned between the caps and said heater to shield the caps from excessive heat, said shield being normally positioned out of shielding relation, and means operable upon the cessation of the advancement of said caps to effect movement of said shield into shielding position.

ISAAC L. WILCOX.