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CROWN-RETAINING HEADS FOR BOTTLE-CROWNING MACHINES

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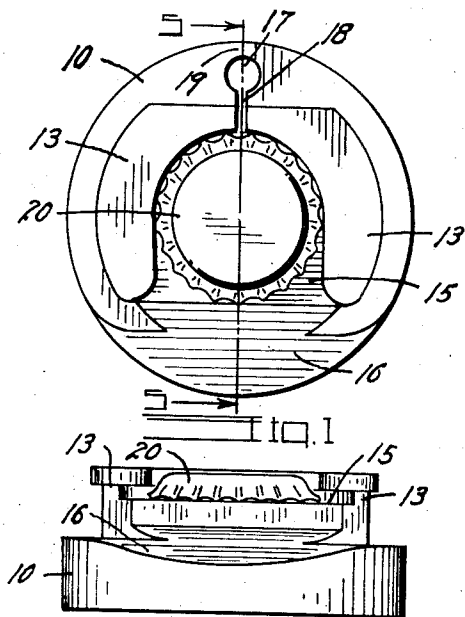
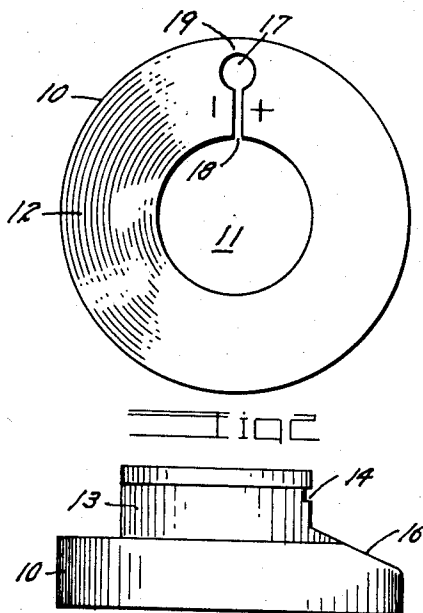


Fig. 1

Fig. 2

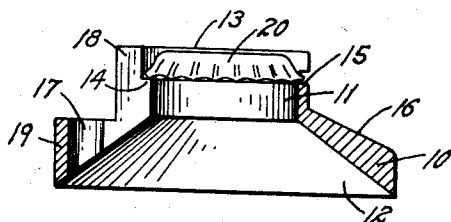
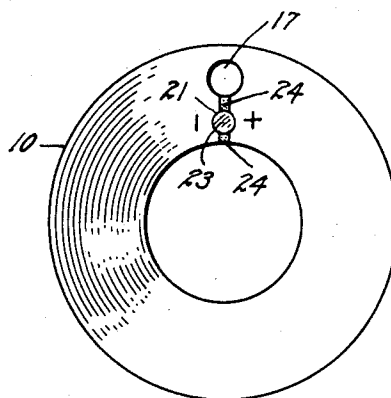


Fig. 3

Fig. 4

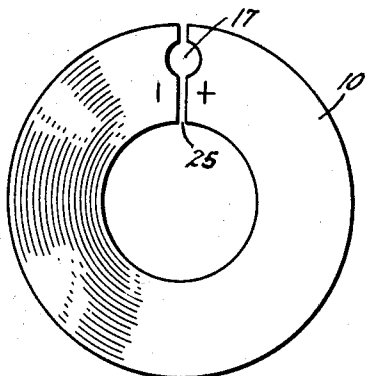
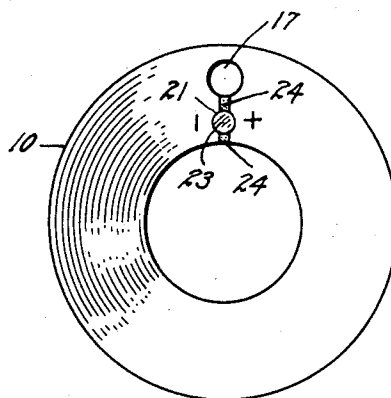


Fig. 5

Fig. 6

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1

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CROWN-RETAINING HEADS FOR BOTTLE-CROWNING MACHINES

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4 Claims. (Cl. 53—343)

This invention relates to a bottle-crowning machine of the type illustrated in applicant's copending application Serial No. 639,444, filed February 11, 1957, and more particularly to an improved crown head for such a machine.

Conventional bottle-crowning machines employ a horizontally rotating turret provided with a circular series of crown-receiving heads. A bottle crown is fed into each head in succession, and each head is forced downwardly in succession about the neck of a bottle positioned therebelow, to position the crown on the bottle, where it is crimped in place on the neck thereof. The heads then rise into the turret and travel to the crown chute to receive the next successive crown.

For various reasons a crown will occasionally fail to completely enter the head or will become tilted therein so that when the head descends on the bottle, the cap is misplaced, resulting in a damaged uncapped bottle.

The principal object of this invention is to provide a cap-receiving head for bottle-capping machines which will be permanently magnetized, and in which the magnetic poles will be so arranged as to magnetically attract the crowns to their proper positions in the heads and retain them in the proper position until they are in place on the bottle.

Another object of the invention is to incorporate the improved magnetic features in a conventional crown-receiving head without interfering in any way with the design of the head and without the addition of any elements to the conventional heads or to the bottle-crowning machine.

A further object is to provide means whereby the conventional heads now in use can be quickly and easily converted to the improved magnetic type so that the purchase of new heads will be unnecessary.

Other objects and advantages reside in the detail construction of the invention, which is designed for simplicity, economy, and efficiency. These will become more apparent from the following description.

In the following detailed description of the invention, reference is had to the accompanying drawing which forms a part hereof. Like numerals refer to like parts in all views of the drawing and throughout the description.

In the drawing:

Fig. 1 is a top view of a crown-receiving head of a type in common use upon bottle-crowning machines, illustrating a crown in place therein and this invention applied thereto;

Fig. 2 is a bottom view thereof;

Fig. 3 is a front view thereof;

Fig. 4 is a side view thereof looking in the direction of the arrow 4 in Fig. 1;

Fig. 5 is a medial cross-section therethrough, taken on the line 5—5, Fig. 1; and

Figs. 6 and 7 are bottom views illustrating alternate adaptations of the invention.

A conventional head of the type described comprises

2

a circular steel block 10 having a concentric round opening 11 for receiving the neck of a bottle. The neck is guided into the opening by means of an inverted, funnel-like depression in the bottom of the block having an annular, conically-inclined wall 12.

A U-shaped guard wall 13 extends upwardly from the opening 11 along the two sides and back thereof. A cap-receiving shoulder 14 surrounds the neck opening 11 and forms a flat cap-receiving surface 15 at the open front of the U-shaped guard 13.

The block 10 is inclined downwardly at its front, as shown at 16, to clear the crown chute of the machine as the heads travel thereby. The block is also provided with a vertical locking pin opening 17 at its rear through which a pin on the machine extends to lock the head in place in the turret of the machine.

As thus far described the head is conventional. This invention makes no change in the general design of the conventional head.

In applying this invention the cross-section of the rear portion of the annulus formed by the block is reduced. This reduction may be accomplished by making a saw cut 18 in the head. The saw cut extends from the neck opening 11 rearwardly through the guard wall 13 and the conical wall 12 to the pin opening 17 in the axial plane of the latter. The saw cut 18 does not extend to the periphery of the block, so that a relatively small cross-section of steel 19 fixedly joins the two sides of the block rearwardly of the pin opening 17. This small cross-section serves to structurally reinforce the block across the saw cut and also serves as a magnetic "keeper," as will be later described.

After the saw cut is completed, the block is magnetized in any suitable manner, such as by placing the poles of a powerful electro-magnet against the block upon opposite sides of the saw cut 18 and electrically energizing the electro-magnet with a high amperage direct current. The block could also be magnetized by wrapping a coil of heavy wire through the neck opening 11 and about the annulus of the block, then applying a heavy current to the wrapped coil.

Regardless of the method used, the block becomes in effect a horseshoe-type permanent magnet with its two poles on opposite sides of the saw cut 18, as indicated at "+" and "-" in Fig. 4. The small cross-section 19 acts as a "keeper" for the magnet and concentrates the magnetic lines of force between the opposed poles.

The conventional crowns used on bottles, such as illustrated at 20, are stamped from sheet steel and are magnetically attractable. Therefore, as they slide upon the receiving surface 15 from the crown chute, they will be immediately magnetically attracted rearwardly on the cap-receiving shoulder 14 toward the two poles of the permanent magnet and will be securely held in place therein, as indicated in Figs. 1, 3, and 5.

The front of the block, it being mid-way between the magnetic poles, will have little or no attraction for the crown so that there will be no magnetic interference to the entry of the crown within the confines of the guard wall 13.

Should additional mechanical strength be found desirable, the alternate form of Fig. 6 may be employed. In this form, a vertical hole 21 is drilled through the block between the pin opening 17 and the neck opening 11. The saw cut 18 is then made in the block as previously described and as shown at 22 in Fig. 6. A non-ferrous plug 23, such as a brass plug, is driven into the hole 21 and is brazed or soldered to the two sides of the saw cut and the two sides of the saw cut are brazed together, as shown at 24, as a structural reinforcement. The magnetic action previously described will not be effected, as the plug 23 and its attaching medium are non-magnetic.

3

Should it be found that the block is sufficiently strong for machine use without a connection across the saw cut, the form of Fig. 7 may be used. In this form the saw cut, shown at 25, is continued completely through the annulus of the block to completely separate the magnetic poles. This form will, of course, have greater magnetic attraction for the crown but will have less structural strength. The structural strength could be increased, if desired, by brazing the two sides of the saw cut together.

In all forms the principle is the same. The conventional block is converted into a permanent magnet and the point of least or no cross-section is at the rear of the block so that the magnetic attraction will be concentrated at the rear to attract the crown fully into the confines of the U-shaped guard wall 13.

The invention has been described as applied to conventional heads for making them magnetically attractable. The invention could be initially applied in the original manufacture of the heads, in which case the heads could be made with a reduced rear cross-section to avoid the necessity for the saw cut. Therefore, the term "saw cut" as used herein indicates any notching, indenting, separating, or reducing of the cross-section.

While a specific form of the improvement has been described and illustrated herein, it is to be understood that the same may be varied, within the scope of the appended claims, without departing from the spirit of the invention.

Having thus described the invention, what is claimed and desired secured by Letters Patent is:

1. A crown-receiving head for bottle-crowning machines comprising: a circular block of magnetized material; a concentric neck hole through said block; a crown-supporting shoulder formed in said neck hole; and a U-shaped crown guard extending upwardly from said

4

neck hole on the rear and two sides thereof to retain a crown in place on said shoulder, the cross-section of the annulus of said block at the rear being less than at the front thereof so as to form two opposed magnetic poles at the rear to magnetically attract a crown rearwardly into the confines of said guide flange.

2. A crown-receiving head for bottle-crowning machines comprising: a circular block of magnetized material; a concentric neck hole through said block; a crown-supporting shoulder formed in said neck hole; a U-shaped crown guard extending upwardly from said neck hole on the rear and two sides thereof to retain a crown in place on said shoulder; and a saw cut extending radially outward through the annulus of the block at the rear thereof to form two opposed magnetic poles at the rear of said annulus to magnetically attract crowns rearwardly into the confines of said guide flange.

3. A crown-receiving head for bottle-crowning machines as described in claim 2 having a structural bridging medium of non-magnetic material joining the two sides of the saw cut.

4. A crown-receiving head for bottle-crowning machines as described in claim 3 in which the saw cut terminates before the circumference of the block is reached to form a "keeper" of magnetic material joining the two sides of the saw cut.

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