

July 7, 1970

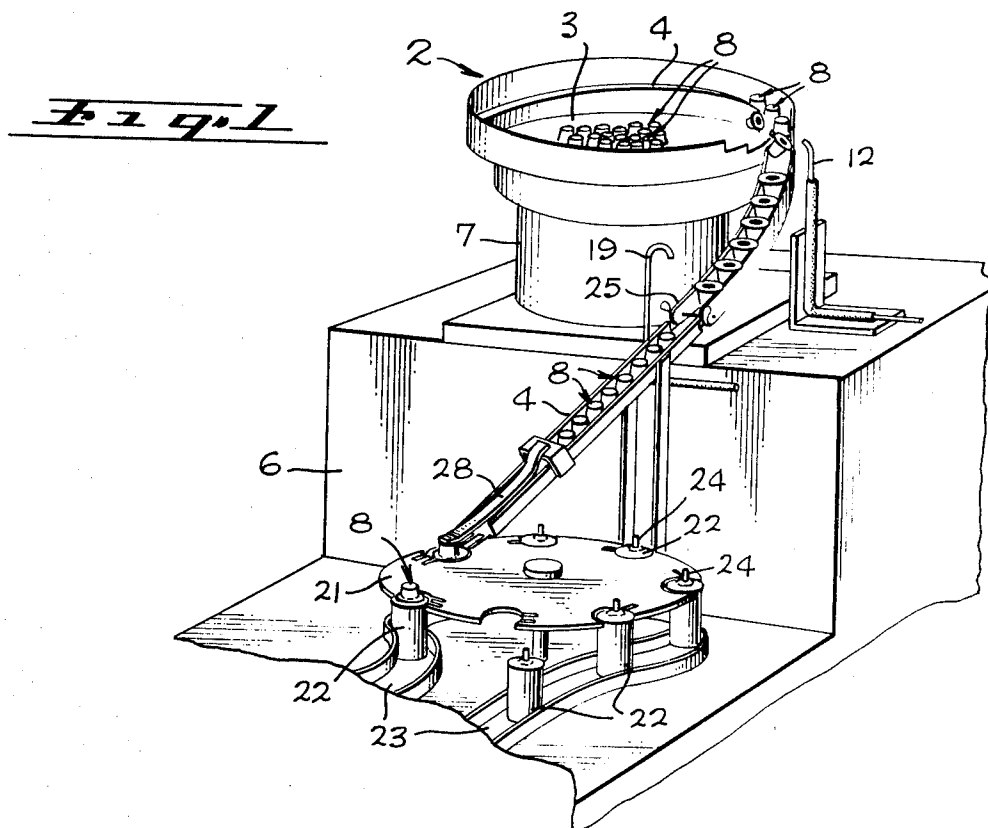
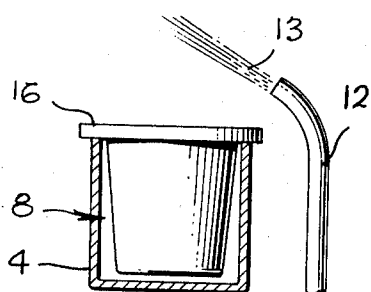
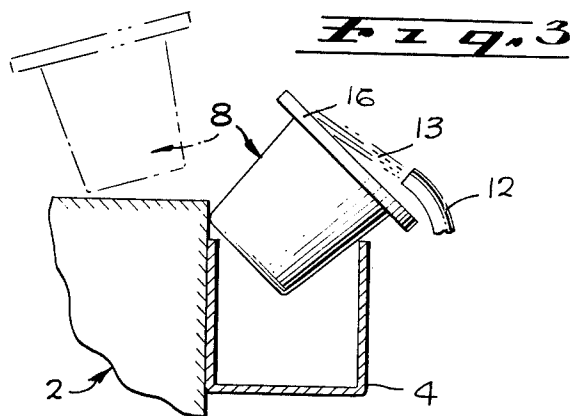
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3,518,744

CAP REJECTOR

Filed May 1, 1967

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 4

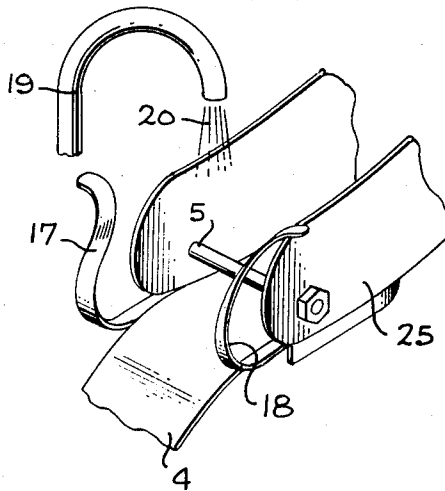


Fig. 5

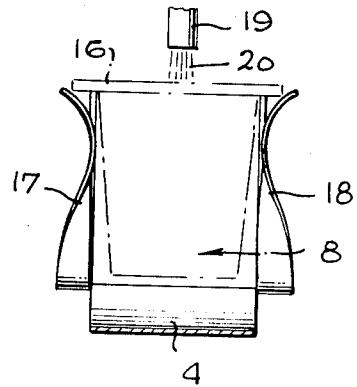


Fig. 6

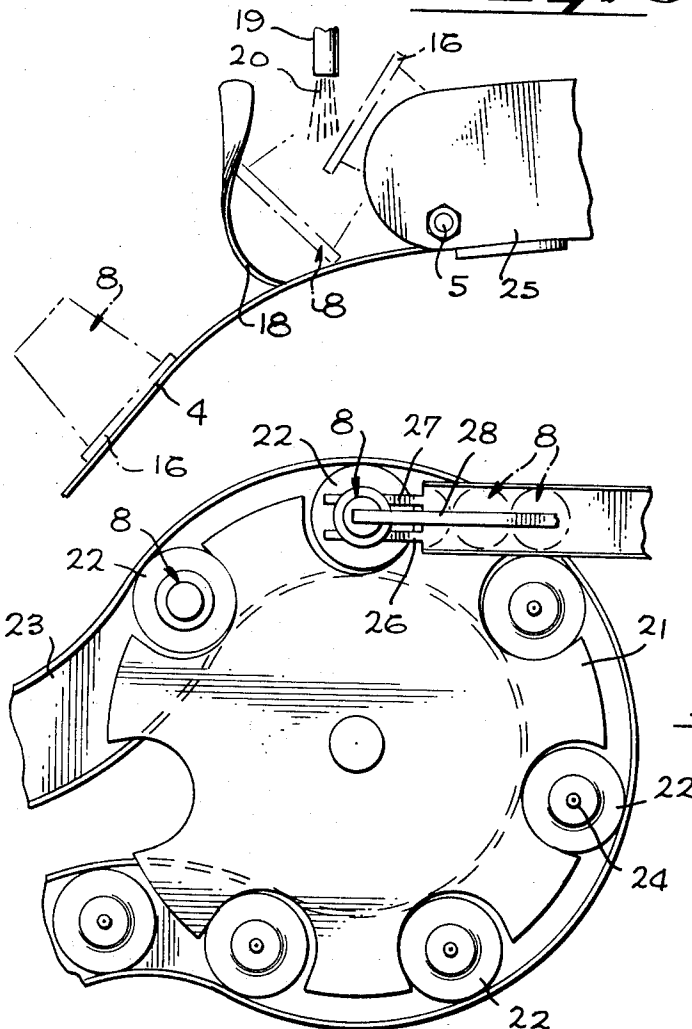


Fig. 8

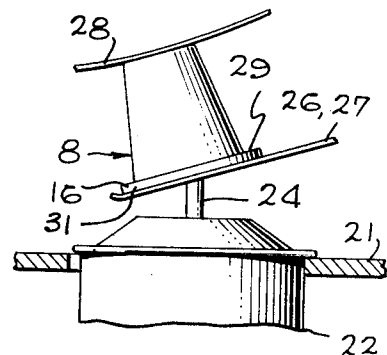


Fig. 7

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3,518,744
CAP REJECTOR

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2 Claims

ABSTRACT OF THE DISCLOSURE

An apparatus for placing caps on containers having vertically projecting stems is provided which comprises means for continuously orienting the caps into a position with their open end down, means for continuously moving the caps in succession along a track into a holding means at the termination of the track, pressure release means for holding the first cap in a stationary position and releasing it under external pressure exerted against the cap, means for moving cans under the stationary caps and into contact therewith so that the stem of the can exerts an external pressure against the cap and releases it from the holding means on to the vertical stem.

This invention relates to an apparatus for placing caps on containers, and particularly concerns an apparatus for placing caps on aerosol cans having a vertically projecting stem.

FIG. 1 is a perspective view of the invention showing the sequence of operation.

FIG. 2 is a cross-section through the channel showing the relationship of the cap and rejector.

FIG. 3 is a second cross-sectional view through the channel showing the relationship of the cap and rejector.

FIGS. 4 through 6 illustrate the mechanism used to invert the caps during their movement along the channel. FIG. 4 is in perspective; FIG. 5 a section and FIG. 6 a side view.

FIG. 7 is a plan view of the mechanism used to transfer the caps from the channel to the stem of the can.

FIG. 8 illustrates in detail the transfer of the cap to the can.

Feeder 2 is a commercially available Syntrol feeder comprising a reservoir 3 and a channel 4 forming a perimeter around the reservoir 3. The base 6 houses a motor, vibrating mechanism (not shown) and supports the reservoir 3 and riser 7. The vibrating mechanism is physically connected to the reservoir 3 through the riser 7. Vibrations are transmitted to the reservoir 3 causing the caps 8 to move indiscriminately.

In response to vibration, the caps move along inclined channel 4 and into an extension of the channel 4. As the caps move along the channel 4, they are randomly oriented. Vertically oriented caps 8 with their open end 16 up will seat in the channel 4. Caps oriented in any other position will not seat in the channel 4.

As the caps move down the channel 4, they pass a tube 12 emitting a jet of air 13. The tube 12 is positioned so the trajectory of the air jet 13 passes over the top of the seated caps (as shown in FIG. 2) and contacts those which are not seated (as shown in FIG. 3). The unseated caps are blown back into the reservoir 3 and the seated caps will pass down the extension of the inclined channel 4. Caps returned to the reservoir 3 are recycled to the channel 4 under impetus of the continuous vibration of reservoir 3.

As mentioned, FIG. 2 illustrates caps 8 with its open end 16 in a vertical position. In this position, cap 8 is seated in channel 4. As it moves past the tube 12, the air jet 13 passes over the cap 8 and the cap 8 continues to move in channel 4.

In FIG. 3, the cap 8 is not seated in channel 4, and as it moves past the tube 12 the air jet 13 contacts the cap 8, blowing it back into the reservoir 3. This rejection mechanism prevents improperly oriented caps from moving down the channel 4.

Caps 8 are inverted during their movement along channel 4 to position each for transfer onto the vertical stem of the cans. The inversion mechanism is illustrated in FIGS. 4 through 6 and comprises a section 25 of channel 4 having a steep slope and provided with a transverse pin 5 secured to sidewalls of channel 4 and bridging the space therebetween. Pin 5 acts as a trip bar, whereby the cap 8 is caused to tip forward. Two fingers 17 and 18 secured to the sidewalls of channel 4 engage the cap 8 and stabilize it while it is inverted. Tube 19 is positioned over channel 4 and an air jet 20 from tube 19 propels the cap 8 into an inverted position. The cap 8 then continues to move down inclined channel 4 in the inverted position.

FIG. 5 illustrates the position of the tube 19 and air jet 20 above channel 4 and cap 8.

FIG. 6 is a side view of channel 4 further illustrating the inversion of the caps 8 to position the open end 16 of the cap 8 in a downward direction.

FIG. 7 illustrates a star wheel 21 which receives cans 22 from a conveyer 23 and moves them radially along conveyer 23. The cans 22 are of the aerosol type commonly used today in consumer products such as shaving cream, whipped cream, whipped toppings, insecticides and hair spray. Each of the cans 22 has a vertically projecting stem or spout 24, and the stem 24 is utilized to transfer the cap 8 to the cans 22.

At the termination of the channel 4 is a spring loaded mechanism for holding the caps. The mechanism consists of two tracks 26 and 27 which form an extension of channel 4 and an overhead lever spring 28 which contacts the top of the cap 8. The lever spring 28 prevents the cap from sliding off the tracks 26 and 27 without the application of force.

As the star wheel 21 rotates, the cans 22 are successively moved under the tracks 26 and 27. The tracks 26 and 27 are inclined as illustrated in the side view of FIG. 8. Stem 24 passes under the back edge 29 of the cap 8 and contacts the front side 31 of the cap 8. The pressure asserted by the stem 24 against the inside edge 31 of the cap 8 pulls the cap from under the lever spring 28, and the cap 8 slides off tracks 26 and 27 and onto the can 22. As the can moves down the conveyer 23, an overhead rotating wheel (not shown) applies pressure to the cap 8 and snaps it into position on top of the can 22.

While the invention has been described with reference to a particular preferred embodiment, it will be appreciated that modifications of the preferred embodiment will occur to those skilled in the art upon reading the foregoing specifications. Accordingly, it is intended that those modifications which fall within the broad scope of the appended claims be included.

Having described the invention, what is claimed is:

1. An apparatus for placing caps on containers having vertically projecting stems which comprises in combination.

(A) means for continuously orienting the caps into a position with their open end down;

(B) means for continuously moving the caps in succession along a track into a holding means at the termination of the track;

(C) pressure release means for holding the first cap in a stationary position and for releasing the cap when external pressure is exerted against the cap;

(D) means for moving cans under the stationary caps and into contact with the caps so that the stem

3

of the can exerts an external pressure against the cap and releases the cap from the holding means onto the vertical stem;

(E) means for rejecting incorrectly oriented caps.

2. An apparatus for placing caps on contains having vertically projecting stems which comprises in combination: 5

(A) means for continuously orienting the caps into a position with their open end down, said means consisting of a vibrating reservoir, a channel leading from the reservoir on which caps move from the reservoir under impetus of the vibration and a means for returning to the reservoir incorrectly oriented caps; 10

(B) means for continuously moving the caps in succession along a track into a holding means at the termination of the track; 15

(C) pressure release means for holding the first cap in a stationary position and for releasing the cap when external pressure is exerted against the cap; and 20

4

(D) means for moving cans under the stationary caps and into contact with the caps so that the stem of the can exerts an external pressure against the cap and releases the cap from the holding means onto the vertical stem.

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