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VACUUM CHUCK FOR CONTAINER CLOSURE LINING MACHINERY

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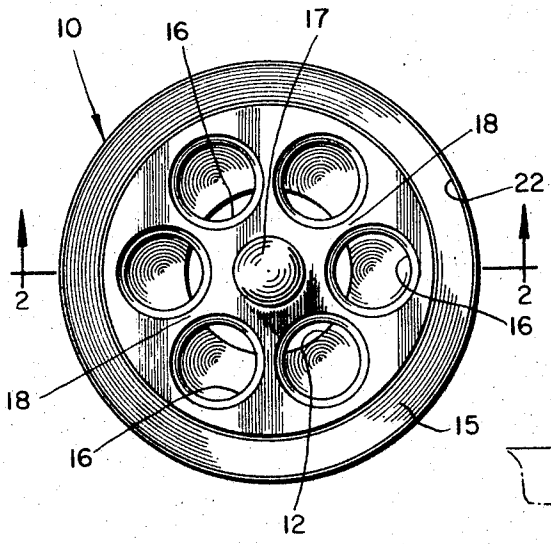


FIG. 1

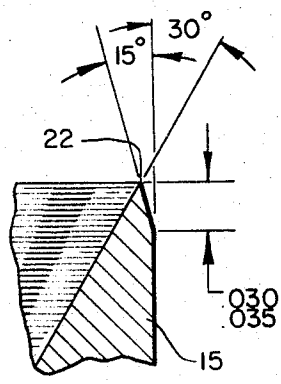


FIG. 3

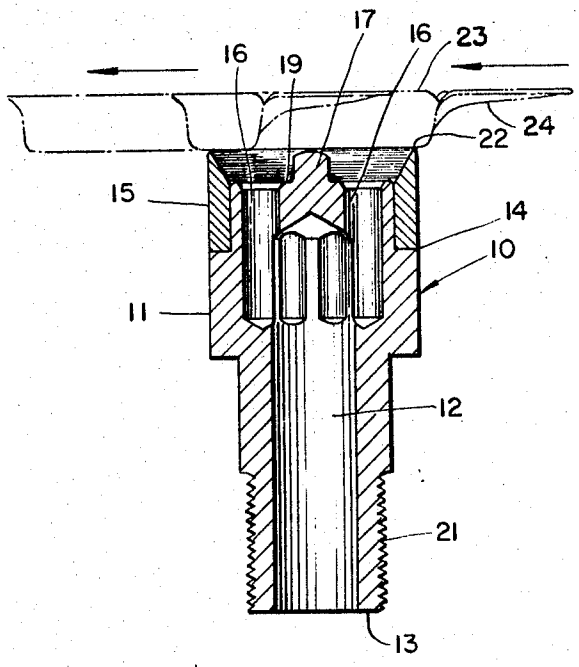


FIG. 2

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VACUUM CHUCK FOR CONTAINER CLOSURE LINING MACHINERY

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U.S. Cl. 279—3 4 Claims

ABSTRACT OF THE DISCLOSURE

A chuck for crown closure lining machines adapted to position unbalanced tab type crown shells properly which includes a peripheral rim on the chuck, a centrally located pin to prevent tilting of the crown, and uniform spacing of air passages around the pin, thus maintaining the crown shell level during the lining operation.

This invention relates to vacuum chucks used in closure lining machines and particularly to a vacuum chuck designed to line bottle crowns.

Bottle crowns are sealed by means of a gasket which is interposed between the metallic crown and the mouth part of the bottle. Quite commonly the material from which the gasket is made is applied to the crown in a liquid form which later, either by heating or by drying, is consolidated into a solid gasketing substance. The lining operation is accomplished by centering the crown on a rotating chuck and then injecting a measured quantity of fluid lining composition into the crown.

To hold the crown on the chuck while it is rapidly rotating, a pressure differential is established by a so-called "vacuum chuck." In the past, these chucks have been provided with a flat face at the periphery and a counterbore in the remaining area of the chuck face. The floor of the counterbore has often been tapered and leads to an axial bore extending through the chuck which, through rotary joints, connects to an air-displacement device.

Crown lining machinery runs at very high speeds. Often a single lining head will produce 300 crowns a minute. If any misfeeding occurs, time and material losses become very substantial.

The chucks which have previously been described work well with crowns of conventional design, but with the advent of the so-called "tab-cap" or the "baseball cap," which includes a flap extending radially outwardly from one side of the crown and now used on many soft-drink and beer containers, the unsymmetrical nature of the cap causes tilting unsymmetrical lining, and misfeeding.

The chuck of the present invention permits all types of crowns whether conventional, tab, or baseball crowns to be run on the same machine and substantially eliminates the tilting, jamming, and misfeeding of tab and baseball crowns which occur when chucks of conventional design are used.

The essential features of the new chuck design include a peripheral edge support for the crown and a central pin which prevents any tilting of the cap from occurring whether the cap is being pushed on to or pushed away from the chuck by the feeding mechanism. The invention may best be understood by reference to the drawing, in which

FIG. 1 is a top plan view of the improved chuck,

FIG. 2 is a vertical section on the line 2—2 of FIG. 1, and

FIG. 3 is a detail sectional view of a knife edge formed at the chuck periphery.

Specifically, the chuck **10** comprises a cylindrical body **11** which extends upwardly from its lower end **13** to a point approximately ¼ of an inch above the shoulder **14**. Body **11** is shouldered at **14** as shown, to receive a removable ring **15**, formed from a suitable metal such as carbide or all tool steel, which is cemented to the body **11**. Spaced counterbores **16** drilled inwardly from the face of the body and so placed that their centers lie on a concentric circle, intersect and open into bore **12**. A central pin **17** of the body **11** is supported by the webs **18** which extend between the counterbores **16**, and projects upwardly from the face **19** to a point about 0.015 inch below the rim of the ring **15**. The tip of the pin may be flat or provided with radii, but preferably it is convex or dome-shaped, to support a crown in movement to and from the chuck.

The upper margin of ring **15** is preferably finished as shown in FIG. 3 to produce a sharp and carefully stoned edge. Its inner face descends at an angle of approximately 30° to the vertical; its outer face, for a distance of about 0.030 to 0.035 inch below the upper margin lies at an inward angle of 15° to the vertical. While a ring with a knife edge is preferred, satisfactory placement of crowns on the chuck is achieved with rings having a flat or radius surface.

The function of a carbide ring is solely to increase the service life of the chuck. Obviously, with some loss of service life, the chuck could be unitary and a knife-edge could be formed on the body **11**.

The lower portion of the body **11** is externally threaded at **21** to allow the chuck to be screwed into the hollow rotating drive shaft of a lining machine (not shown).

The presence of the sharp knife-edge **22** permits a cap, even if it is domed, to seat on the chuck so that a proper pressure differential is maintained. This, together with the action of the pin **17**, prevents the crown from seating at a tilt angle.

Further, the presence of the pin prevents any cap which is inherently unstable, such as the cap **23** having a lifting tab **24** as shown in FIG. 2, from tilting or sliding downwards into the counterbore as the cap is moved from the chuck. As a consequence, this chuck can, without any machine adjustments, except those nozzle adjustments required to control the volume and placement of the lining, handle all types of caps which now appear on the market. The occurrence of misfeeds and jams due to the unbalanced nature of the tab and baseball type caps is substantially eliminated.

We claim:

1. A vacuum chuck adapted for use in container closure lining machinery which machinery possesses a hollow rotatable chuck spindle connected to air-displacement means, said chuck comprising

(a) a body having an upper end-face formed into a peripheral edge projecting upwardly therefrom,

(b) a pin centrally located with respect to the margin of said peripheral edge and terminating slightly below the vertical extent of said edge,

(c) a plurality of counterbores formed in said upper end-face between said edge and said pin,

(d) an axial bore extending from an opening in the opposite end of said body to a point of intersection with all of said plurality of counterbores thereby forming an air passage through said body, and

(e) means adjacent the lower end of said chuck to permit its attachment to a rotatable spindle of a closure lining machine.

2. A chuck according to claim 1 wherein the upper end-face is formed of a removable ring.

3. A chuck according to claim 1 wherein the peripheral margin of the upper end-face is provided with a knife edge.

4. A chuck according to claim 1 wherein the face of the pin has a convex surface.

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ROBERT C. RIORDAN, *Primary Examiner.*

U.S. Cl. X.R.

118—55; 269—21