

[54] CONTAINER SUPPORT IN A CAPPING MACHINE

[75] Inventor: David J. Over, Richmond, Ind.

[73] Assignee: Aluminum Company of America, Pittsburgh, Pa.

[22] Filed: Jan. 26, 1973

[21] Appl. No.: 326,767

[52] U.S. Cl. 53/329, 53/334

[51] Int. Cl. B67b 3/08

[58] Field of Search 53/329, 276, 367, 368, 53/369, 300, 331, 287, 324, 325, 42, 334; 198/131

[56] References Cited
UNITED STATES PATENTS

690,488	1/1902	Valerius.....	53/276
1,278,829	9/1918	Beck.....	53/368
2,698,122	12/1954	Pechy.....	53/367 X
2,732,116	1/1956	Merrill.....	53/42

2,974,455	3/1961	Ravn.....	53/42
3,572,007	3/1971	Shelby et al.	53/329 X
3,577,701	5/1971	Bott et al.	53/329 X

Primary Examiner—Travis S. McGehee
Assistant Examiner—Horace M. Culver
Attorney, Agent, or Firm—David W. Brownlee

[57] ABSTRACT

A container support is provided in a capping machine including a platform having an upwardly open recessed seat in it and a spring supported depressible pedestal in the seat, which in its raised position has its top surface substantially coplanar with the upper surface of the platform so that the container can be moved laterally into and out of position on the platform, and in its depressed position permits seating of the container in the seat for support of the lower peripheral portions of the container during capping.

1 Claim, 3 Drawing Figures

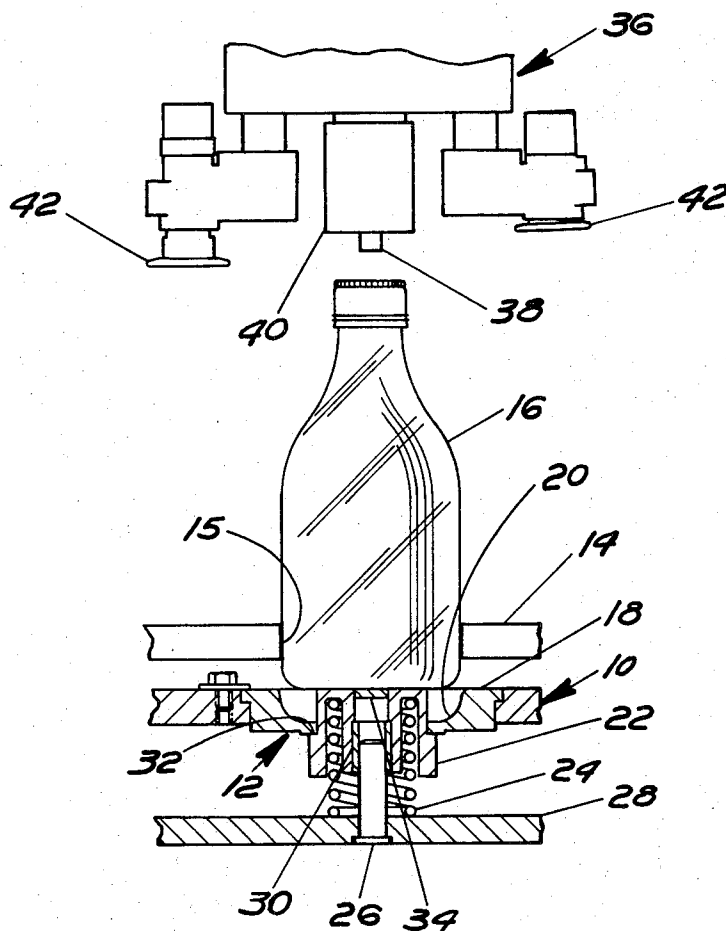


FIG. 1.

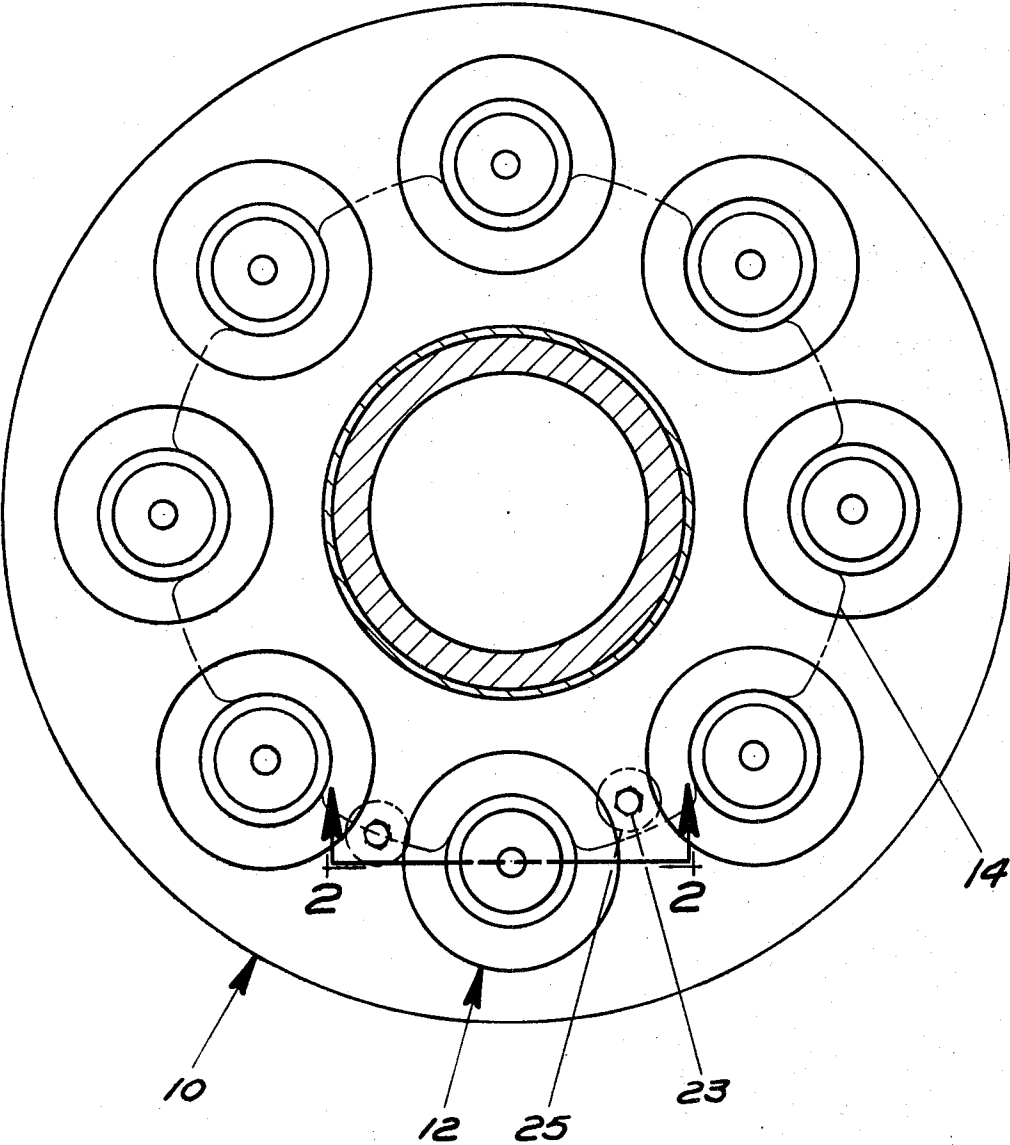


FIG. 2.

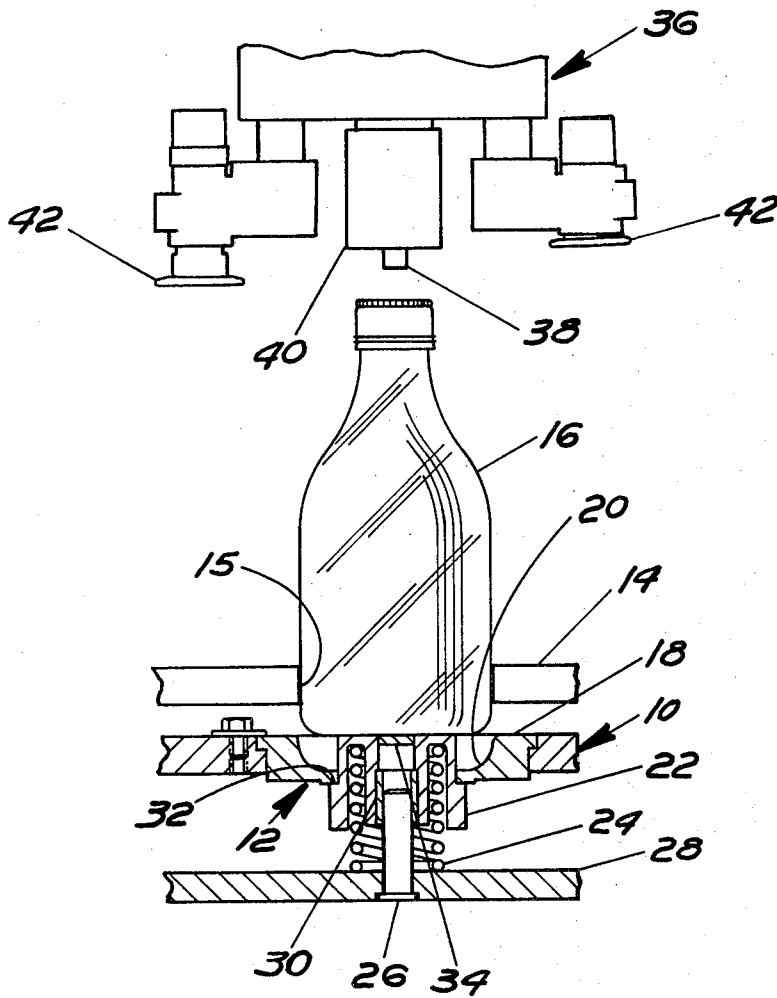
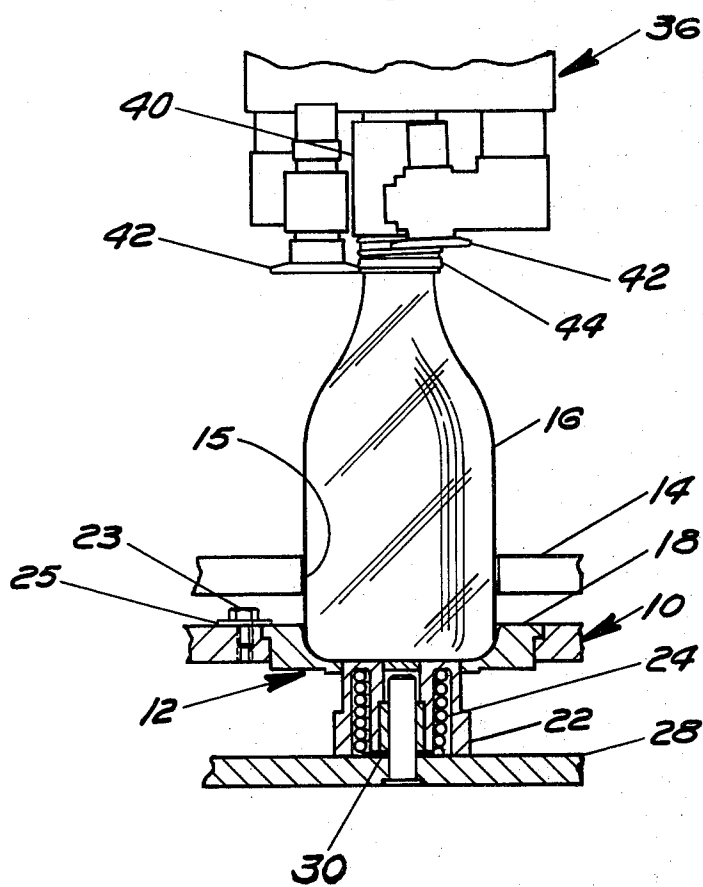


FIG. 3.



CONTAINER SUPPORT IN A CAPPING MACHINE

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to capping machines, and in particular to a support for a container in a capping machine.

2. Description of the Prior Art

Machines for capping containers such as glass bottles, or the like typically use star wheels, or other positioning means for moving containers into and out of the capping machines and for holding the containers in position under the capping heads during capping. During such capping, the containers are usually positioned on a flat platform or base which supports the containers against the force of any top load applied against the closures and containers during the capping operation. When the containers are flexible and/or fragile, additional support may be required for the sides of the containers so that the sides are not collapsed or broken. Accordingly, baskets, cups or the like have been used for supporting the containers during capping as is disclosed in U.S. Pat. Nos. 309,922 and 2,738,118. However, such baskets or cups are not completely satisfactory since the containers must be positioned in and removed from such cups and this can slow the capping operation.

The prior art is lacking in a cup support for a deformable container for use in a high speed capping machine.

SUMMARY OF THE INVENTION

This invention provides a support for a container in a capping machine comprising a platform having a recessed seat in it conforming to the shape of the exterior surfaces of the lower peripheral portions of a container to be capped, and a vertically movable pedestal in the seat which is adapted to support a container in the plane of the upper surface of the platform for feeding containers into and removing them from the seat, and which can be depressed or lowered when top load is applied against the container so that the container is supported in the recessed seat during capping.

Accordingly, an object of the invention is to provide a cup support for a collapsible container which is adapted for use in high speed capping machines.

Another object of the invention is to provide a support for the lower peripheral portions of a container during capping.

A further object of the invention is to provide a platform with a recessed seat in it for receiving the bottom portions of a container during capping and having a depressible pedestal in the seat for supporting the container in the plane of the upper surface of the platform so that a container can be moved laterally into position and out of position without interference with the recessed seat.

The above and other objects and advantages of the invention will be more fully understood and appreciated with reference to the following description and the drawings attached hereto.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a cross-section through a capping machine and shows the base of the capping machine with a plurality of container supports of the invention mounted in the base.

FIG. 2 is a partial cross-section through a support of the invention and shows a container in raised position on the support.

FIG. 3 is a partial cross-sectional view similar to FIG. 2 except with the pedestal in the support depressed and the container seated in the support.

DESCRIPTION OF A PREFERRED EMBODIMENT

FIG. 1 is a cross-sectional view through a turret type capping machine looking down on the base 10 of the capping machine and shows a plurality of container-supports 12 in the base. The top portion of the capping machine may comprise a rotatable turret, not shown, which includes a capping head above each of the container supports 12. Such a capping machine which includes container supports 12 of the invention may be adapted to apply roll-on caps, screw-on caps or swage-on caps by means of apparatus which is well known in the art and which therefore need not be illustrated for purposes of understanding this invention. In such a capping machine, containers are fed into the machine by means of a star-wheel, screw feed or the like at an entry station, the base 10 and turret rotates around the axis of the capping machine while closures are sealed or otherwise secured on the containers, and the closed containers are removed laterally from the capping machine at a discharge station. Such capping machines may include a spider 14 with outwardly open C-shaped contact edges 15 thereon for positioning containers under each of the capping heads so that closures can be sealed on the containers.

During the sealing or closing operation, it is typical of many capping machines that a top load is applied against the containers, and such top load can damage or collapse the containers if they are made of frangible material or relatively flexible plastic material. It is therefore desirable to support the sides or bottom of a collapsible container during the capping operation in order to prevent collapse or rupture of the containers. Cup-shaped support members have previously been used for supporting containers during capping, but the containers must be placed in such cup-shaped members prior to capping and removed therefrom subsequent to capping, and this can be time consuming.

It is a feature of this invention that support is provided for the lower portion of a container during capping which does not interfere with transfer of containers into or out of a capping machine. Referring to FIGS. 2 and 3, a container support 12 of the invention is illustrated in detail. FIG. 2 shows support 12 with only the weight of a filled container 16 on it as is the case when a container is transferred into and out of position over the support. FIG. 3 shows the support during capping when the capping head has applied a downward force on the closure and container. Support 12 includes a platform 18 with an upwardly open recessed seat 20 in it, a pedestal 22 which can be moved vertically within the platform and a coil spring 24 for resiliently supporting the platform in the support. Platform 18 has a substantially flat top surface which is coplanar

with the top surface of the base 10 of the capping machine so that containers can slide across the base and the platform when they are transferred into and out of the capping machine. Pedestal 22 also has a substantially flat top surface which, in the uppermost position of the pedestal as is illustrated in FIG. 2, is coplanar with base 10 and platform 18. The pedestal therefore also does not interfere with the transfer of a container 16 into and out of the capping machine.

Pedestal 22 is mounted on a pin 26 which projects upwardly from a plate 28 in base 10 of the capping machine, and the pedestal has a collar or bearing 30 in it which slides on pin 26. Pedestal 22 further has an outwardly projecting, upwardly facing annular shoulder 32 which engages the undersurface of platform 18 in the uppermost position of the pedestal. Such engagement provides a stop for pedestal 22 with the upper surface of the pedestal in the plane of the upper surfaces of platform 18 and base 10 of the capping machine. A bolt 23 and washer 25 hold platform 18 in its seat against the upward force of spring 24 under pedestal 22. Although it is not required a plug 34 may also be provided in the top of the hole through pedestal 22 to provide a continuous surface across the top of the pedestal. FIG. 2 illustrates a spinning headset 36 in the capping machine above container 16 preparatory to affixation of a closure, not, shown, to the container. Spinning headset 36 may be mounted on a capping spindle which is adapted to be moved downwardly against a closure on container 16 and rotated so that rollers 42 on the headset deform the skirt of the closure against the container finish to secure the closure on the container. Spinning headset 36 includes a pin 38 which is adapted to engage the top of a closure as the headset is lowered against the closure positioned on a container. Pin 38 is adapted to move upwardly into the headset so that a pressure block 40 on the headset applies top load against the closure and container while the closure skirt is being deformed against the container finish. Although a roll-on spinner headset has been selected for purposes of illustration, it will be apparent to those skilled in the art that swage-on capping heads or screw-on capping heads may also be used to apply closures to containers supported on container support in accordance with this invention.

FIG. 3 illustrated spinning headset 36 lowered against closure 44 on container 16 so that top load is applied against the closure on the container while the headset is rotated to the closure skirt into affixation against the container finish. When headset 36 is lowered against closure 44 and container 16, the container is forced downwardly against the supporting force of spring 24 under pedestal 22 until the container is seated in platform 18 in container support 12. As seated in platform 18, the lower portions of container 16 are supported by the lateral surfaces of the seat to a height of approximately 1/2 inch on the side of the container. For other containers of different sizes and different strengths, platforms may be provided which may support the side of a container to heights in the range of 1/4 inch to 2 or more inches. Contact edges 15 on spider 14 in the capping machine may also support the side of a container during the capping operation although such spider is usually not relied upon for such support since the contact of such edges usually extends only approximately 1/2 of the way around the container. However, additional peripheral support may

also be provided around the upper portion of a container by means of jaws or the like which are to be moved against the sides of the container as is known in the art.

In the operation of a capping machine having a plurality of container supports therein as illustrated in FIGS. 1-3, containers 16 are fed laterally into the machine by means of a star wheel or the like not shown. As a container is being fed into the machine, pedestal 22 is in its uppermost position because spring 24 is designed to support the weight of the filled container. Accordingly, container 16 slides across the surface of base 10 of the capping machine and across platform 18 and pedestal 22 into position over the seat in the platform. Spider 14 locates container 16 in its position under the capping head. Closures 44 may be positioned on the containers either before or after the containers 16 are fed into the capping machine. Headsets 36 are lowered against each closure 44 on its container 16 which depresses the container against pedestal 22 to seat the container in platform 18. Rollers 42 on headsets 36 then deform the skirt of the closure against the container finish to secure the closure on the container. Once the closure has been secured on the container, the headset is raised off the container, permitting pedestal 22 and spring 24 under the pedestal to raise the container out of the seat in the platforms. Each such closed container can then be moved laterally out of the capping machines by means of a star wheel or the like not shown, as is well known in the art.

Another feature of this invention is that a capping machine with base 10 in it can be quickly and easily changed from sealing of closures on plastic bottles which are supported in seats 20 in platforms 18, to sealing of closures on glass bottles which are supported on flat platforms. Bolt 23 and washer 25 at each container supporting position in base 10 are adapted to be removed permitting platforms 18 to be lifted out of their seats and replaced with other platforms which have continuous flat top surfaces for supporting glass containers in the plane of the top surface of the base. Pedestal 22 and spring 24 at each support position either can remain in base 10 or can be removed therefrom when such flat platforms are mounted in the base. The turret height may be adjusted to compensate for the fact that the glass bottles are not depressed during capping.

It is therefore seen that a cup support is provided for a container during capping which does not interfere with the operation of the capping machine. The cup supports the lower portion of the container so that it will not be collapsed or ruptured by top load applied against the container during capping. Although a preferred embodiment of the container support has been illustrated and described, it will be apparent to those skilled in the art that numerous modifications could be made in the container support without departing from the invention or the scope of the claims appended hereto. For example, the pedestal in the container support could be mechanically raised and lowered with cam means or the like rather than employing a spring as is described and illustrated. It will also be apparent that a capping machine in which the container supports are mounted may be any of a variety of well known capping machines which apply a top load against containers during the closing operation.

What is claimed is:

5

1. In a capping machine having a rotary table, a plurality of container supports each of which comprises a platform rigidly secured in the table with its upper surface substantially coplanar with the upper surface of the table and having a central aperture through the platform and recessed seat around the aperture substantially conforming to the exterior surface of the lower peripheral portions of a container to be capped including a seat portion for underlying the peripheral portion of the bottom of such container for rigidly sup-

6

porting the container against top pressure applied against a container during capping, a vertically movable pedestal in the aperture in the platform, stop means for arresting the upward travel of the pedestal with its upper surface substantially coplanar with the upper surface of said platform, and spring means which is adapted to hold the pedestal in its uppermost position except when depressed by a force greater than the weight of a filled container.

* * * * *

15

20

25

30

35

40

45

50

55

60

65