

[54] **CONTAINER LID**

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[21] Appl. No.: 87,090

[52] U.S. Cl. 220/60 R, 220/44 R, 220/97 R

[51] Int. Cl. B65d 43/10, B65d 21/00

[58] Field of Search 220/60 R, 97 R, 97 F, 44 R

[56] **References Cited**

UNITED STATES PATENTS

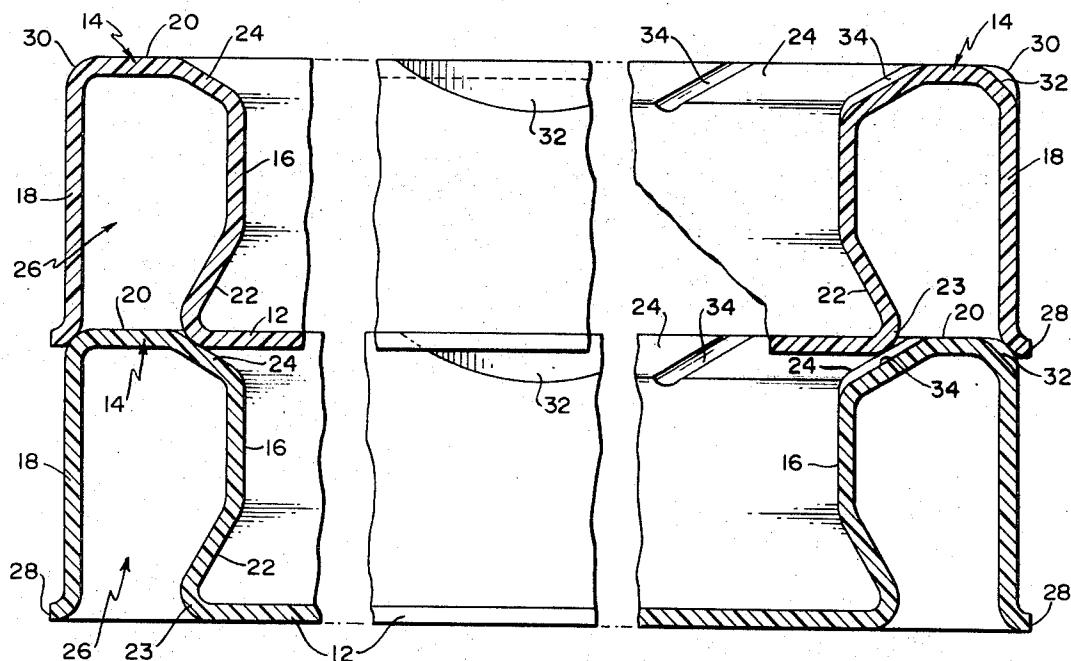
3,589,552	6/1971	Fitzgerald	220/97 R X
3,240,383	3/1966	Scholtz	220/44 R

Primary Examiner—George E. Lowrance
Attorney—Wolf, Greenfield and Sacks

[57] **ABSTRACT**

A plastic container lid is adapted for use in high speed automated packing techniques in which a number of lids are loaded in stacked configuration and are drawn from the bottom of the stack in succession to cap successively presented containers. The region of each lid which engages the next uppermost adjacent lid in the stack is provided with specially formed surfaces to communicate the region between the stacked lids with the atmosphere. This avoids any tendency for a plurality of lids to stick together when drawn from the stack.

2 Claims, 2 Drawing Figures



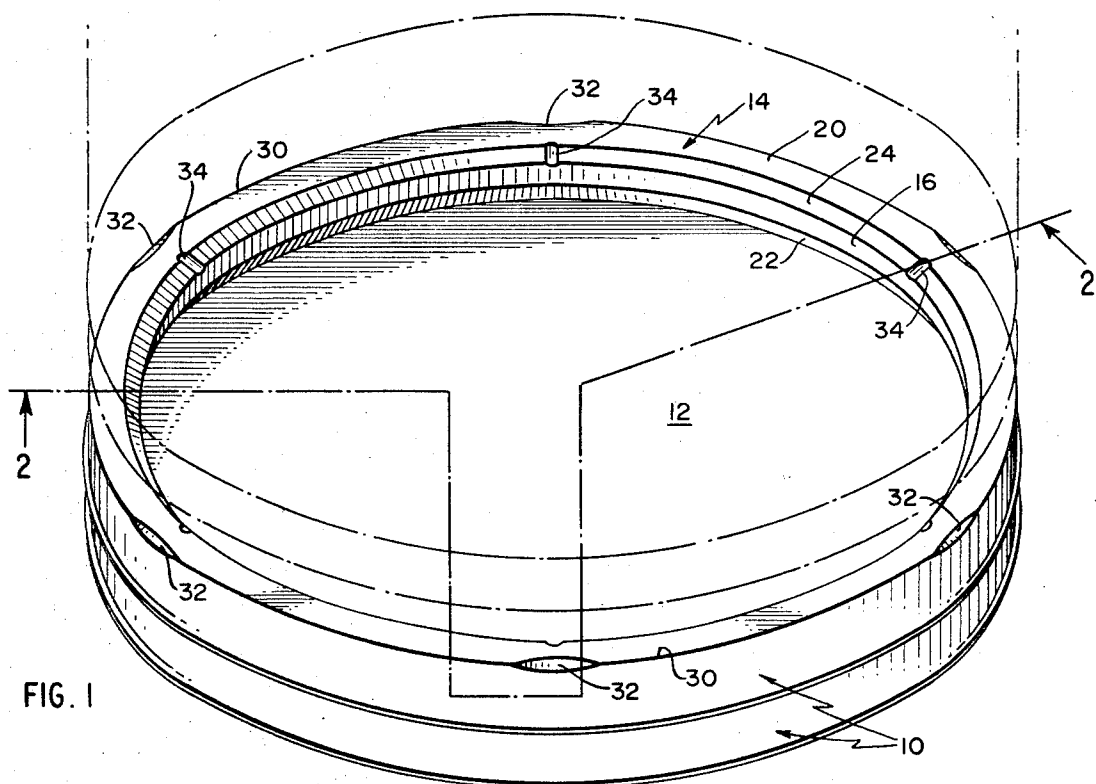


FIG. 1

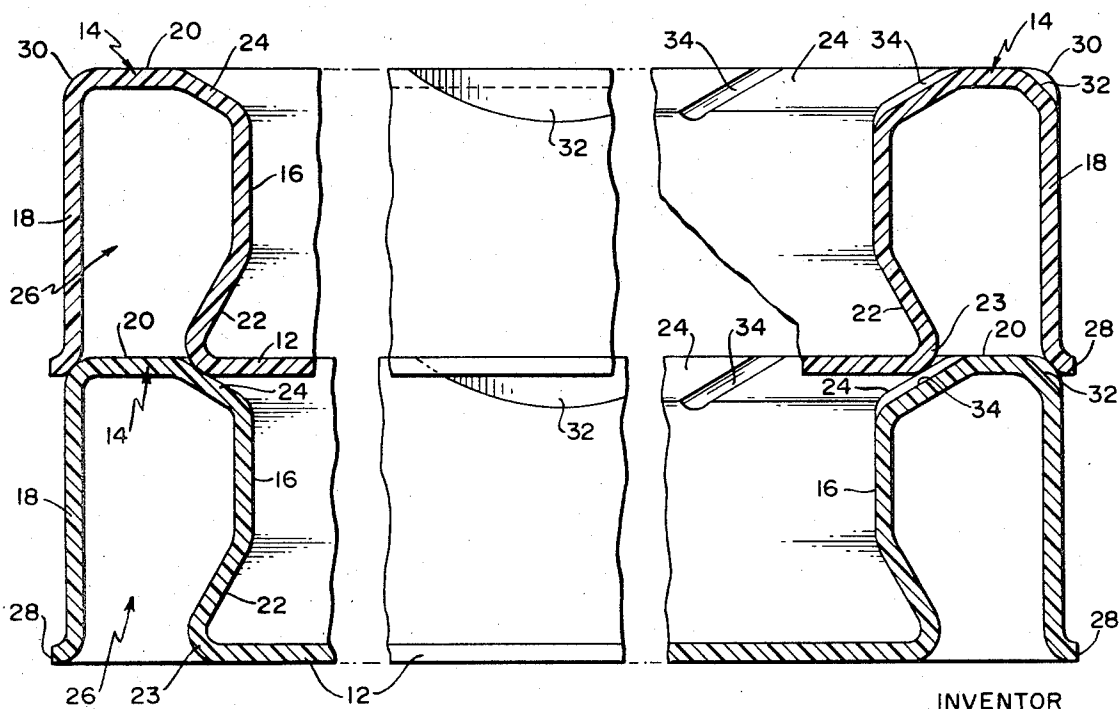


FIG. 2

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CONTAINER LID

BACKGROUND OF THE INVENTION

This invention relates to an improved construction for a container lid and, more particularly, to a container lid adapted for use in high speed packaging techniques in which a plurality of such lids are loaded into the packaging machine and then are rapidly and individually withdrawn.

In automated packaging techniques where the containers are filled and then capped with a lid, the containers and lids are loaded in a stacked configuration into magazines in their separate stations in the machine. Appropriate mechanisms are employed to withdraw the containers, fill the containers, withdraw the lids from the stack and then cap each filled container with a lid. It is obviously desirable that these operations be carried out rapidly.

One technique for withdrawing the container lids individually and in rapid succession is to employ a vacuum gripping device which engages the lowermost lid in the stack to effectively grip the lid and then pull the lid quickly away from the stack. Because the lids are of identical configuration and have closely mating nesting surfaces, the lids tend to seal against each other. Thus, when operating at high speeds, rapid withdrawal of the lowermost lid tends also to withdraw the next lower lid or lids from the stack. This occurs because the speed of operation does not afford sufficient time for the air to bleed into the sealed chamber between adjacent nested lids.

It is among the primary objects of the invention to provide an improved lid construction which avoids the formation of a sealed chamber between stacked adjacent lids and which is therefore suited for use in high speed lid dispensing devices.

SUMMARY OF THE INVENTION

In brief, the invention is incorporated into an illustrative lid which may be employed to cap a beverage cup. The lid is generally flat and has a circumferential channel extending about the lid. The cross-sectional configuration of the channel is generally U-shaped and opens downwardly to define an annular space to receive the rim of the container to be capped. When a plurality of such caps are stacked one on top of another, the upper surface of the channel fits snugly within the channel at the underside of the next upper lid in the stack. The fit is extremely close and tends to form at least a partial seal between interengaged lids.

In order to insure that only the bottom lid in the stack will be removed, the upper external surface of the channel is formed with a plurality of circumferentially spaced depressions which do not engage the underside of the next upper lid so as to provide an air passage between the stacked lids. When the lowermost lid is gripped and withdrawn quickly, there is no partial seal which might tend to draw the next upper one or two lids along with the lowermost lid.

While the invention has particular application in machine which feed lids by drawing them by suction cups one at a time from the bottom of a magazine, the invention also has advantages where the lids are sliced fed automatically or are handled manually by an operator.

Among the primary objects of the invention is to provide a lid adapted for use in high speed packaging machines.

A further object of the invention is to provide a lid adapted to be stacked in nested relation and in which any tendency for adjacent lids to remain together is eliminated.

DESCRIPTION OF THE DRAWINGS

These and other objects and advantages of the invention will be understood more fully from the following detailed description thereof with reference to the accompanying drawings wherein:

FIG. 1 is an illustration of two identical container lids constructed in accordance with the invention and showing the manner in which such lids are stacked; and

FIG. 2 is a cross-sectional view of a larger scale of the two stacked lids taken along the line 2—2 of FIG. 1.

DESCRIPTION OF THE PREFERRED EMBODIMENT

FIG. 1 shows two typical container lids of the type in which the invention may be employed and the manner in which the lids may be stacked. Each lid 10 shown is of circular configuration and is formed from a thin sheet of plastic by well-known vacuum or pressure forming techniques. The lid includes a generally flat closure wall 12 and an integral circumferential rim indicated generally by the reference character 14.

The rim 14 is of generally inverted U-shaped cross-section having an inner wall 16, an outer wall 18 and a top wall 20. The juncture of the closure 12 and the inner wall 16 may be tapered downwardly and outwardly as shown at 22 to define a circular bead 23 at the underside of the lid for snug engagement with the lid seat of the container (not shown) to be capped by it. Additionally, the juncture between the inner wall 16 and the top wall 20 defines an annular tapered intermediate wall portion 24 which facilitates stacking as described below. The rim 14 therefore defines a downwardly open annular channel 26 which receives the rim of the container to protect the rim, keep it clean and in some forms to define a seal at the mouth. The lower edge 28 of the outer wall 18 may be flared outwardly, also to facilitate nesting.

When the lids are stacked in the nested configuration in readiness to be dispensed in the packaging machine, the rims of adjacent lids engage one another. Thus, as shown in FIG. 2, the outer edge 30 of the rim 14 of the lower lid fits within the flared lower edge 28 of the outer wall 18 of the next upper lid, engages the bead 22 of the next upper lid. Because the lids are formed to rather close tolerances, each lid is effectively identical to the other lids, and they mate with one another so as normally to create at least a partial seal at their rims.

In order to eliminate the effect of the partial seal and permit the lids to be separated individually and rapidly, the outer edge 30 and tapered intermediate wall portions 24 of each lid are formed with depressions which define passages between the contacting surfaces of the rim structures of adjacent lids. As shown in the drawings, a plurality of circumferentially-spaced, flats 32 are formed about the outer edge 30 of the lids. These flats 32 are only slightly below the surface of the remainder of the outer edge 30 but nevertheless are ef-

fective to provide sufficient communication across the mated outer edge 30 and lower edge 28. The seal between the intermediate wall 24 and the bead 3 similarly is broken by a corresponding number of circumferentially spaced depressions 34 which extend 5 radially along the intermediate wall portion 24. In the embodiment shown, the same number of flat 32 and depressions 34 are present but it is to be understood that their numbers and/or locations need not correspond with one another. The flats 32 and depressions 10 34 may obviously be formed simultaneously with the formation of the lid itself by providing appropriate shape in the dies.

By the foregoing lid construction a plurality of venting paths are provided across the mating regions of the stacked lids, which eliminate any tendency for adjacent lids to become sealed to each other. This permits the lids to be separated from the stack one at a time very rapidly and, therefore, the form lends itself to high speed operation. And while the lid construction is particularly advantageous for use in automatic handling equipment, the lid configuration is also advantageous when they are to be handled manually, for the lids separate easily and there is no tendency for the operator to pick up more than one lid at a time. 20 25

It should be understood that the foregoing description of the invention is intended merely to be illustrative thereof, and that other embodiments and modifications will be apparent to those skilled in the art without departing from its spirit.

Having thus described the invention, what I desire to

claim and secure by Letter Patent is:

1. A container lid comprising:

a closure wall and an integral rim formed circumferentially thereabout, said rim being of generally U-shaped cross-sectional configuration and defining a downwardly open circumferential channel designed to engage another identical lid stacked below;

said rim comprising an inner wall, an outer wall, ending at a lower edge, a top wall, and a tapered intermediate stacking wall portion between said inner wall and top wall,

said inner wall and outer wall being substantially equal in axial extent,

means forming circumferentially spaced radially extending depressions in said intermediate wall portion and second means forming circumferentially spaced depressions at a juncture of said top wall and outer wall, to provide a passage across engaged rims of two stacked lids to the space between the closure walls of said adjacent stacked lids when said stacked lids are in contact with each other at a first set of points defined by said intermediate wall portion and at a second set of points defined by said juncture of said top wall and outer wall and spaced outwardly from said first set of points.

2. A container lid in accordance with claim 1

wherein said second means comprise chordal flats at the juncture of said top and outer walls. 30

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,724,710 Dated Apr. 3, 1973
Inventor(s) Paul Davis

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 2, line 53, after ",", and before "engages" insert --and the intermediate wall 24--. Column 3, line 3, cancel "3" and substitute --22--; line 7, cancel "flat" and substitute --flats--.

Signed and sealed this 12th day of March 1974.

(SEAL)
Attest:

EDWARD M. FLETCHER, JR.
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents