

[54] DRINKING RECEPTACLE COVER AND LIP OPERATED VALVE

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[58] Field of Search ..... 220/90.2, 90.4, 90.6; 222/481, 482, 484, 557, 508, 518; 229/7 R

[56] References Cited

UNITED STATES PATENTS

3,015,411	1/1962	Smith.....	220/90.4
3,208,629	9/1965	Beeson.....	220/90.4
3,338,467	8/1967	Albert.....	220/90.4
3,730,399	5/1973	Dibrell et al.....	220/90.4
3,739,938	6/1973	Paz.....	220/90.4

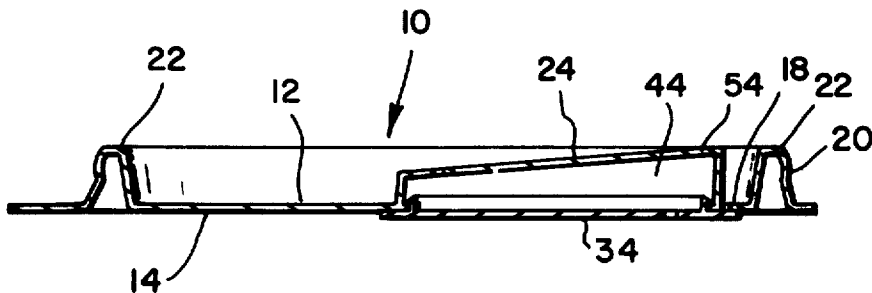
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[57] ABSTRACT

A drinking receptacle cover and lip operated valve wherein a cover is adapted sealingly to engage and en-

close the upper open end of a drinking receptacle such as a styrofoam cup or the like, the cover being provided with a resiliently hinged valve support normally tending to be disposed above the upper surface of the cover and a valve member fixed to the valve support when the valve support is deflected downwardly toward the lower surface of the cover, the valve member engaging a valve seat surrounding an opening in the cover below the valve support and the resilient character of the hinge structure of the valve support tending to hold the valve member upwardly against the seat and sealingly to prevent fluid from leaking from the receptacle when tipped over; the valve support having an upwardly protruding portion adapted to be operated by a person's lip for drinking from the edge of the cover when the person's lip depresses the valve support; said valve and said valve support having vent openings therein with a chamber therebetween so as to provide for the venting of vaporous fluid from a cup over which the cover is sealingly secured; the disclosed method being related to the forming of the valve support in a resiliently disposed position above the upper surface of the cover and then depressing the valve support and fixing the valve member thereto so that it is resiliently held against or adjacent to the lower surface of the cover and sealingly to engage and seal around an opening below the valve support.

6 Claims, 4 Drawing Figures



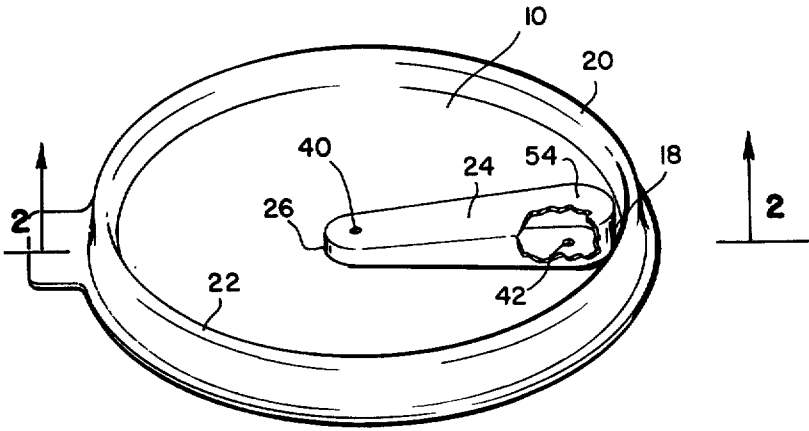


FIG. 1.

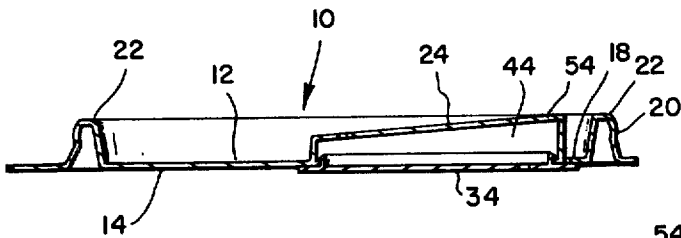


FIG. 2.

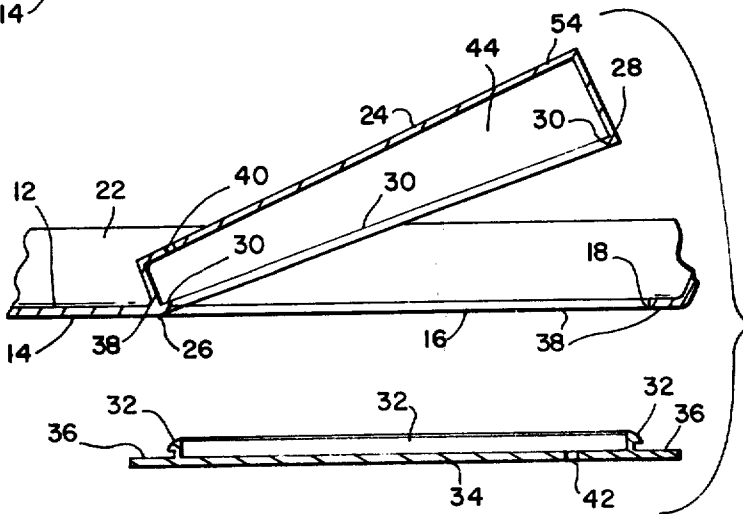


FIG. 3.

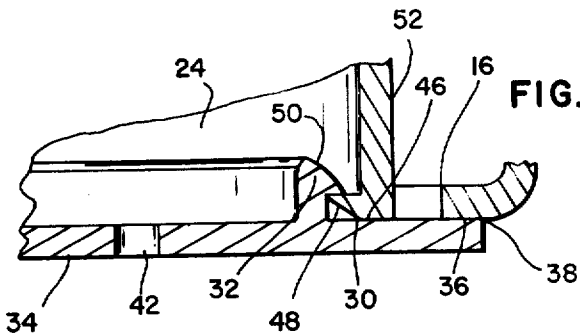


FIG. 4.

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## DRINKING RECEPTACLE COVER AND LIP OPERATED VALVE

### BACKGROUND OF THE INVENTION

Various covers have been constructed for drinking receptacles and have been provided with lip operated valves for enclosing the cover and the receptacle until such time as a person's lip has depressed the valve and forced it open relative to an opening in the cover during drinking a fluid from the receptacle. Heretofore such covers and valve structures have been relatively complicated and expensive to produce and have not attained a position relative to volume markets or relative to the conventional disposable cover market normally exploited by means of the usual styrofoam sheet cover on styrofoam drinking cups or the like. It has been desirable to enclose and cover drinking receptacles so that the contents thereof will not readily spill when the receptacle is tipped over, and also to provide a cover such that a person may readily drink therefrom by depressing a lip operated valve. Heretofore various means have been provided for resiliently maintaining a valve seated relative to a cover and such valves and covers have been costly to produce and assemble and consequently have not become popular in the high volume market such as enjoyed by the conventional disposable polystyrene or other covers. The conventional polystyrene covers, however, do not have valves and are therefore only suitable for covering the drinking receptacle and must be removed for drinking the contents therefrom.

### SUMMARY OF THE INVENTION

The present invention relates to a novel drinking receptacle cover and lip operated valve and also to a novel method for producing the same.

The drinking receptacle cover and lip operated valve of the invention comprises a cover adapted sealingly to engage the upper open end of a drinking receptacle, and this cover is provided with upper and lower sides and has an opening therethrough. At one side of said opening a valve support is resiliently integral with the cover and the resilient integral connection of the valve support is such as to hold the valve support upwardly substantially above the upper surface of the cover and a valve member is fixed to said valve support when said valve support is depressed downwardly toward the lower surface of said cover so that the resilient character of the hinge structure of the valve support holds the valve member upwardly against a seat surrounding the opening in the cover.

The invention comprises novel first and second interlocking means carried by the valve support and the valve member, respectively, and this interlocking means is snapped together when the valve support is depressed toward the lower side of the cover so as to interlock the valve member with the valve support by simple and single press fitting operation. The resilient character of the valve support holds the valve member seated against a seat portion at the lower surface of the cover surrounding a drinking opening therein which is disposed near the rim of the cover.

The valve support is a generally box shaped structure providing a vent chamber and also extending upwardly relative to the upper surface of the cover so as to be engaged by a person's lip for opening the valve member relative to its seat to allow fluid to flow from the inner

portion of the receptacle outwardly through the opening in the cover and to be drunk by the person whose lips are on the periphery of the cover.

The box shaped valve support of the invention is provided with a vent opening therein and the valve member of the invention is provided with a vent opening therein and these vent openings are offset so that they do not communicate directly with each other across a chamber between the valve member and the top of the valve support. This arrangement prevents fluids from escaping directly from one vent opening to another during a time when a drinking receptacle containing hot coffee or the like is tipped over. Under these conditions the drinking receptacle cover and lip operated valve of the invention is normally closed and prevents undue spillage of coffee or the like when drinking receptacles are inadvertently tipped over.

Accordingly, it is an object of the invention to provide a novel drinking receptacle and lip operated valve which is very simple and economical to produce and which, when in volume production, may be made of various materials such as polystyrene sheet and thereby afford economy so as to permit the drinking receptacle and lip operated valve structure of the invention to be a disposable item.

Another object of the invention is to provide a novel resiliently hinged valve support and connected valve member adapted to operate relative to a lower surface of the drinking receptacle cover of the invention for holding the valve member closed against a valve seat surrounding an opening in the cover.

Another object of the invention is to provide a novel method for producing a drinking receptacle cover and lip operated valve wherein the cover is first produced with an opening therein and an integral valve support, integral with and hinged to said cover at one side of said opening, and normally disposed elevated above said cover, and whereby the valve support may be depressed toward the lower surface of the cover whereupon a valve member is snapped into interlocking relation with the valve support and the resilient hinge structure of the valve support holds the valve member upwardly against a seat surrounding the opening in the cover.

Other objects and advantages of the invention may be apparent from the following specification, appended claims and accompanying drawings.

### BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a drinking receptacle cover and lip operated valve showing portions of the valve support structure of the invention broken away to amplify the illustration;

FIG. 2 is a sectional view taken from the line 2—2 of FIG. 1;

FIG. 3 is an exploded view of the cover and lip operated valve of the invention showing a normally upward position of the valve support relative to the opening in the cover; and

FIG. 4 is a sectional view taken substantially on the same plane as that of FIG. 2 but showing the structure of the invention on a large scale to illustrate the interlocking structures on the valve support and the valve member of the invention.

### DESCRIPTION OF THE PREFERRED EMBODIMENTS

As shown in FIGS. 1 and 2 of the drawings, the invention comprises a drinking receptacle cover 10 having upper and lower surfaces 12 and 14. The cover is provided with an opening 16 extending therethrough from the lower surface 14 to the upper surface 12. This opening 16 is provided with one side 18 adjacent to a rim 20 of the cover 10. This rim 20 may be a substantially conventional rim adapted sealingly to engage a conventional drinking receptacle such as a styrofoam cup or the like. It will be seen that this rim 20 is provided with an uppermost annular portion 22 which is disposed above the upper surface 12 of the cover 10 and this cover 10 including the rim 22 is a substantially disc shaped structure. It will be seen that the rim 22 is a generally channel shape in cross section annular structure adapted to fit over the interior and exterior of the rim of a conventional styrofoam cup; however, other peripheral structures of the cover 10 may be utilized sealingly to engage the open end of various drinking receptacles.

A generally box shaped valve support 24 is provided with a resilient hinge portion 26 which is integral with the cover 10 at a side of the opening 18 opposite to the side 18 adjacent the rim or peripheral portion 20.

The hinge 26 and the cover 10 are made of resilient material and as shown in FIG. 3 of the drawings the hinge portion 26 normally holds the valve support 24 in a position substantially above the upper surface of the cover 10 at a free end 28 of the valve support 24. The box shaped valve support 24 is provided with interlocking ledge means 30 at its lower open portion and these locking ledge portions 30 are cooperable with and engageable by conforming interlocking portions 32 on a valve member 34 which, as shown in FIG. 2 of the drawings, is fixed to the valve support 24 and the valve member 34 is provided with valve seat engaging structure 36 extending beyond the interlocking portions 32 and extending beyond the confines of the opening 18. The cover 12 at its lower surface 14 being provided with a valve seat portion 38 generally at the lower surface 14 and surrounding the opening 16. Accordingly, the resilient character of the hinge structure 26 tends to move the valve support 24 into the elevated position shown in FIG. 3 but when the valve member 34 at its interlocking portions 32 is interlocked with the interlocking portions 30 of the support 24 the portions 36 of the valve member 34 engage the seat portions 38 around the opening 16 in the cover 10 and thus the valve support 24 as shown in FIG. 2 tends to move upwardly and this is due to the resilient memory of the hinge structure 26; and as the valve support 24 tends to move upwardly it brings the valve seat engaging portions 36 of the valve member 34 against the valve seat structure 38 at the lower surface 14 of the cover 10 and thereby provides for the sealing of the upper open end of a drinking receptacle or the like when it is engaged at its rim by the channel shaped rim structure 22 of the cover 10.

The valve support 24 is provided with a vent opening 40 therein and the valve member 34 is provided with a vent opening 42 and these vent openings are offset as shown in FIG. 1 of the drawings so as to communicate with different areas of a chamber 44 maintained in the

box shaped valve support 24 and above the valve member 34 connected thereto.

As shown on enlarged scale in FIG. 4 of the drawings, the box shaped structure of the valve support 24 is provided with a normally lower edge 46 and the interlocking ledge structure 30 is provided with an upwardly inclined hook 48 which may resiliently be engaged by pressing a downwardly inclined hook structure 50 of the interlocking means 32 thereagainst. It will be seen that when the valve support 24 is pressed downwardly to the position as shown in FIG. 2 that the valve member 34 may be pressed into fixed relation therewith by a simple pressing operation, forcing the hook shaped portions 48 and 50 of the interlocking portions 30 and 32 together. In this manner the wall of the box shaped structure of the valve support 24 deflects until the interlocking hook shaped structures 48 and 50 are hooked together and in this manner the valve member 34 may be snapped into connected relation with the valve support 24.

It will be seen that the opening 16 as shown in FIG. 4 of the drawings extends substantially beyond the outer edge portions 52 of the valve support 24 in order to allow liquid to flow around the valve support 24 when it is depressed to force the valve seat portions 36 of the valve member 34 away from corresponding seat portions 38 at the lower surface 14 of the cover 10.

It will be seen that the box shaped valve support 24 as shown in FIG. 1 of the drawings is provided with an upwardly protruding portion 54 which is disposed adjacent the rim 22, and this portion 54 may be engaged by a person's upper lip for depressing the valve support 24 and the valve member 34 to open the valve member 34 relative to the opening 16 and to allow a person to drink from the rim 22 of the cover 10 while the person's upper lip depresses the valve support at its upwardly protruding portion 54.

In accordance with the method of the invention, the cover 10 is produced as indicated in FIG. 3 of the drawings with the valve support 24 resiliently elevated substantially above the opening 16 and above the lower surface 14. The cover and valve support 24 are integral at the hinge 26 and are formed of resilient material so that the resilient memory of the hinge structure 26 holds the valve support 24 substantially above the upper surface 12 of the cover. The valve support 24 is then depressed or resiliently deflected toward the lower surface 14 and the valve member 34 is fixed to the valve support in such position so that the resilient memory of the hinge 26 of the valve support 24 tends to move the valve support 24 upwardly and cause the peripheral portions of the valve member 34 to be seated against a seat surrounding the opening in the cover and thus the method of the invention provides for a very economic forming of the cover and valve support and subsequent operation of snapping the valve member 34 into fixed relation with interlocking portions of the valve support.

It will be obvious to those skilled in the art that various modifications of the invention may be resorted to without departing from the spirit thereof.

We claim:

1. In a drinking receptacle cover and lip operated valve, the combination of: a drinking receptacle cover comprising a generally disc like structure having upper and lower surfaces; said disc like structure having a generally peripheral portion adapted to sealingly and frictionally engage an open end of a drinking receptacle

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cle; said cover having an opening adjacent said peripheral portion; a valve support adjacent said peripheral portion of said cover and resiliently hinged thereto; said valve support having a flexible resilient hinge portion integral with said disc like structure; said hinge portion being spaced from said peripheral portion; said valve support having a vertically movable portion adjacent said peripheral portion; said hinge portion being of material having a resilient memory tending to hold said vertically movable portion of said valve support upwardly relative to said upper surface of said disc like structure; said disc like structure having a valve seat portion surrounding said opening at said lower surface of said disc like structure; a valve member secured to said valve support and normally engaging said valve seat portion for normally closing said opening; said resilient material of said hinge tending to hold said valve member against said valve seat portion; said valve support being of lesser area in the plane of said opening than said opening to allow fluid to flow through said opening and around said valve support portion when said valve member is in open position relative to said seat portion; said valve support having an upwardly protruding portion adapted to be engaged by a person's upper lip, whereby a person may depress said valve support towards said inner surface of said disc like structure, thereby deflecting said resilient hinge portion and causing said valve member to be moved downwardly away from said valve seat portion and to thereby allow fluids to flow through said opening.

2. The invention as defined in claim 1, wherein said valve support portion is provided with a first connection means, said valve member having a second connection means; said first and second connection means having resilient and deflectable interlocking portions adapted to be pressed into interferring relation with each other for locking said valve member to said valve support when said valve support is deflected in a direction toward said inner surface of said disc like structure.

3. The invention as defined in claim 2, wherein said first and second means are hook like ledge structures.

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4. The invention as defined in claim 1, wherein said valve support comprises a generally box shaped structure having a first vent opening therein, said box shaped structure being open toward said lower surface of said disc shaped structure; said valve member substantially closing the open portion of said box shaped structure; said valve member having a second vent opening communicating with the interior of said box shaped structure.

5. The invention as defined in claim 4, wherein said first and second vent openings are offset relative to each other.

6. In a drinking receptacle cover and lip operated valve, the combination of: a drinking receptacle cover comprising a generally disc like structure having upper and lower surfaces; said disc like structure having a generally peripheral portion adapted to sealingly and frictionally engage an open end of a drinking receptacle; said cover having an opening adjacent said peripheral portion; a valve support adjacent said peripheral portion of said cover and resiliently hinged thereto; said valve support having a flexible resilient hinge portion integral with said disc like structure; said hinge portion being spaced from the peripheral portion; said valve support having a generally movable portion adjacent said peripheral portion; said hinge portion being of material having a resilient memory tending to hold said vertically movable portion of said valve support upwardly relative to said upper surface of said disc like structure; said disc like structure having a valve seat portion surrounding said opening at said lower surface of said disc like structure; a valve member secured to said valve support and normally engaging said valve seat portion for normally closing said opening; said resilient material of said hinge tending to hold said valve member against said valve seat portion; said valve support being smaller than said opening to allow fluid to flow through said opening and around said valve support when said valve member is in open position relative to said seat portion.

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